AUGUST
VOL. V. No. 6

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THE COMMERCIAL CAR JOURNAL

Entered as Second-Class Matter at the Post Office at Philadelphia, Pa.

Kaufmann Brothers Buy Six More Packards

KAUFMANN BROTHERS, of Pittsburgh, recently placed an order for six Packard trucks.

This makes twelve three-ton Packards in the Kaufmann service. These trucks will constitute the backbone of the heavy duty hauling for the big department store.

Kaufmann Brothers placed their first order for Packard trucks in May, 1910. After making a careful compilation of costs, they have continued to place repeating orders for Packard vehicles.

Forty-three dry goods and department stores in 23 cities operate 129 Packard trucks

Ask the man who owns one

Packard Motor Car Company, Detroit

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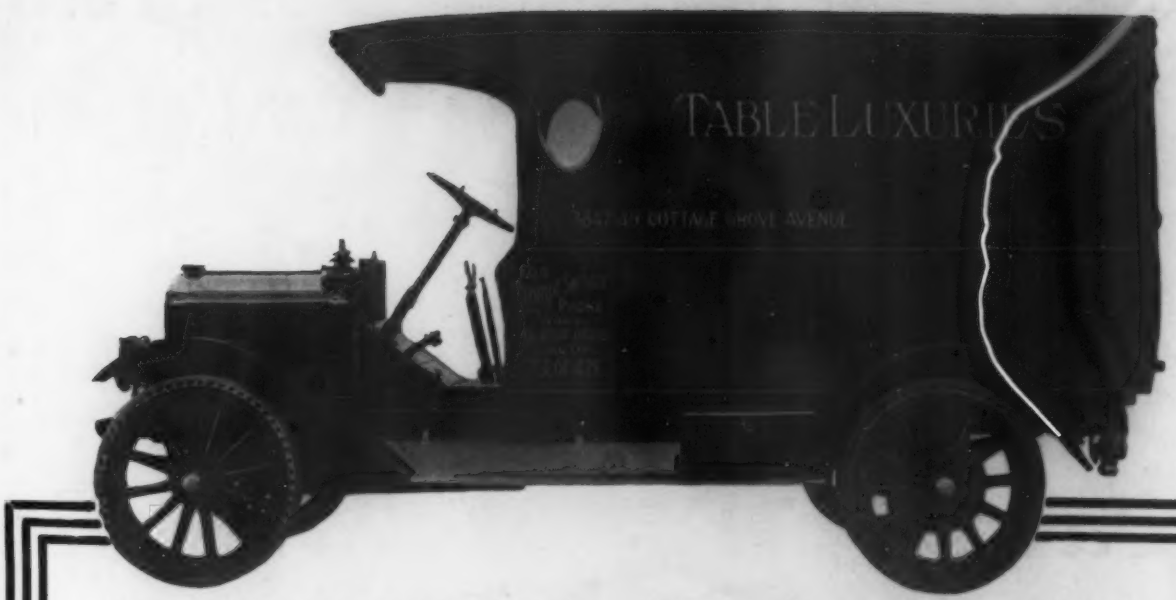

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BROWN

COMMERCIAL CARS

Which will you have—a real commercial car or a pleasure car equipped with a commercial car body? There is a vast difference between them—not so much in appearance as in the service you get. It's a difference that touches your pocketbook nerve. If yours is a little sensitive, it behooves you to get the Brown—a real commercial car.

Every reason for the purchase of a real commercial car that appeals to the buyer appeals with even added force to the dealer. You must either handle such a car or compete with it, and it's a great deal easier and far more profitable to swim with the tide than to try to stem it. In the truck field the tide is running strongly for the greatest efficiency at the least cost, and that is why the Brown is in such high favor.

The Brown Commercial Car will stand the most searching investigation. Test it by its performance; by its construction, both of materials and design; by its cost of maintenance; by its ease of operation; by the service it gives, and you will find it a car that will prove its worth and value on every occasion. It's the kind of car that's a pleasure to sell, because you know the only kind of comeback you will have will be a call for more cars.

Live Agents who want to handle a commercial car that is a service giver and business builder should lose no time in investigating the Brown. We can prove to you that it has rich possibilities in your territory. Ask us about it today.

BROWN COMMERCIAL CAR CO.

PERU, INDIANA

The Publishers Personal Page

"From Trivial Things Great Contests Oft Arise"

It is hard to realize the tremendous growth of the commercial car industry. From the smallest of small beginnings, it has suddenly grown to enormous proportions. Even in 1908 there were but 2500 trucks produced in the entire United States. This number was not increased a thousand the next year, and but 800 or 900 the next year, but in 1911 the industry took a sudden leap to over three times its size the previous year, some 14,000 commercial vehicles being produced. In 1912 another tremendous increase was shown, there being in the neighborhood of 34,000 trucks produced, and the figures for 1913 are, of course, still uncertain, but there is every indication that there will be close to 60,000 trucks built in the United States this year; fully fifteen times the production of 1910.

Did you ever know of a growth of this kind covering a period of six to eight years without a good reason back of it? Is this not conclusive evidence in itself that power-driven delivery vehicles and trucks for heavy transportation have proven that they occupy a place in our economic world, and that it is now but a question of enlightenment until their use becomes universal?

An Opportunity

is here presented. Have you made the most of it? Do you realize that in nearly every case goods can be hauled more cheaply by gasoline than by oats? We grant there are a few exceptions, but our experience has shown that many of the so-called exceptions are not exceptions, but are due to the lack of systematic handling of the power vehicle. The horse has lost his position in our present-day efficient, systematized business. It is known and has been proved by engineers that the horse is actually one of the most wasteful of power producers. To use Edison's words, he eats ten pounds of food for every hour he works; he eats 12,000 pounds a year. He eats the whole output of five acres, and yet his thermal efficiency is only two per cent. He is not only wasteful, but he requires, together with his feed, an enormous amount of space, and in congested business districts space is now valuable. The average horse requires, according to Casson, 750 cubic feet of barn, and, together with his feed, 3,250 cubic feet, and four horses would require 13,000 cubic feet, while a large truck which would do the same work would occupy but 900 cubic feet.

Big Things

We are living in a day of big things. The loads formerly carried by horses are insignificant compared to the tonnage demanded of and hauled daily by power-driven vehicles. Our buildings are larger, the material is heavier and in bigger units. The horse is inadequate to the task. The moving of heavy machinery, of building girders, and other large units is only possible by a great number of horses, which congest the streets, block traffic, and delay the world's progress. Motor-driven vehicles are necessary.

Stop and Consider

the meaning of this tremendous movement, this substitution of engine power for animal power. Consider for a moment what the same substitution has meant in the progress and development of the world in other lines, and you will gain a faint conception of what the result will be in the present instance. It is time for you, Mr. Merchant, to grasp the opportunity of business increase and progression which is at hand. Do not jump in the dark; the first step is to read carefully the accumulated information on the subject. We offer you this data and fund of useful knowledge for the small price of $1 per year. Subscribe now to *The Commercial Car Journal.*

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The Autocar

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You do your business an injustice if you purchase horses or other transportation before first ascertaining the vast business use to which AUTOCARS have been profitably applied. AUTOCARS provide facilities for every merchant's business expansion.

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The Autocar Company — Ardmore, Pa.

ESTABLISHED 1897

SALES AND SERVICE STATIONS:

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Los Angeles San Juan Buffalo Toronto Wilmington Baltimore Washington Scranton Chicago Framingham
St. Louis Atlanta Harrisburg York Lebanon Johnstown Salt Lake City Trenton Lancaster San Diego
Bakersfield, Cal. Cincinnati Pittsburgh Hartford San Francisco West Palm Beach

MOTOR DELIVERY CAR SPECIALISTS

The Commercial Car Journal

VOLUME V | PHILADELPHIA, AUGUST 15, 1913 | NUMBER 6

Y. M. C. A. TO INSTRUCT MEN TO OPERATE TRUCKS

Y. M. C. A. officials in several of the large cities are planning to give special instruction in the handling of commercial cars. If this department of the work is carried out as it should be it will prove a boon to many a truck owner, as at slight expense he can give his drivers additional instruction or obtain competent men in an emergency.

AUTOCAR COMPANY INSTITUTES NEW DEPARTMENT UNDER INSTALLATION ENGINEER

In the interests of its customers, the Autocar Company, of Ardmore, Pa., has instituted a new department, headed by G. A. Wells, formerly chief engineer of Adams Express Company. Mr. Wells is to be known as installation engineer, and the duty of his department will be the thorough study of the delivery and transportation conditions of various concerns, with a view of determining the number and size of motor or horse drawn units that will give them the most efficient service. Mr. Wells has been chief engineer of Adams Express Company for the past ten years. Besides having charge of the purchase, maintenance and operation of these motor trucks, Mr. Wells has also designed and established the various garages and service stations which the Adams Express Company has installed in various cities.

RUMOR DENIED

A rumor was recently going the rounds in New York that the Pierce-Arrow Company, of Buffalo, also the Stevens-Duryea Company, of Chicopee Falls, Mass., had sold out their interests to a group of capitalists. We are assured by both of these companies that there is not the slightest truth in this rumor, and that they have no intention whatever of selling.

FENDERS FOR DETROIT TRUCKS

The Common Council of Detroit in July adopted Ald. Edward Barnett's ordinance requiring all motor trucks of one or more tons capacity be equipped with fenders, within sixty days.

Milwaukee's first commercial vehicle parade will be held on Labor Day, September 1. The plans are being laid by the Milwaukee Automobile Club and it is expected that every available truck will be in line.

The next meeting of the Motor Truck Club of New York will be held at its outing on August 19th at the grounds of the Marine Field Club, Gravesend Bay, L. I.

FIVE-CENT 'BUS LINE FOR NEW YORK CITY —GIRL CONDUCTORS A FEATURE

There was recently incorporated the Peoples' Five-Cent 'Bus Line, with the intention of obtaining a New York franchise for operating a 'bus line on the city streets. It appears that there are several companies endeavoring to get franchises, the one above mentioned, however, having progressed to the extent of having a 'bus made which we herewith illustrate. This 'bus is electrically driven from all four wheels, and is the product of the Commercial Truck Company of America, Philadelphia makers of C. T. Trucks. The car seats about twenty-four passengers, and is of the Pay-as-You-Enter type, with folding doors and step operated from the inside, similar to street cars of this type. Girls will be employed as conductors, and will be seated in front of the rear entrance.

'Bus For People's Five-Cent Line, New York

The Peoples' Five-Cent 'Bus Line is said to be backed by George W. Loft, the well-known candy manufacturer, and John Larkin is one of its leading supporters. There are two other companies endeavoring to obtain franchises, namely, the New York Motor 'Bus Company, of which R. R. Conklin is president, and the Manhattan Motor 'Bus Company, of which Oren Root, who is an old-time street railroad man, is president.

Indications are that there will be considerable rivalry for the control of New York's 'bus franchises. The street railway companies are taking notice, realizing that the establishment of successful 'bus lines, especially those having a five-cent fare, will seriously cut into their business. On this account the New York Railway Company and the Third Avenue Railway Company are offering objections to the granting of franchises on streets or avenues on which they are now operating cars. It is understood that the applications and objections are being considered by the Board of Estimates of New York City, and that at least one of the vehicles, which it is proposed to operate, shall be shown and demonstrated before any franchise will be granted. The Peoples' Five-Cent 'Bus officials have already the vehicle herewith reproduced, and another is just completing.

SUGGESTS BONDING TRUCK DRIVERS

At the July meeting of the Motor Truck Club, at the Hotel Cumberland, 51st & Broadway, New York City, the subject of truck drivers and their effect on truck up-keep costs was discussed. The speaker of the evening was Alfred Aram, an efficiency engineer. In his talk he placed the burden of responsibility for the shortcomings of drivers on the truck manufacturers, and allied industries. After emphasizing the importance of the driver to the motor truck industry, he stated that any person desiring to drive should prove beyond a doubt that he is competent to assume the responsibility.

Following are extracts from his paper:

We have been altogether too languid in coming to the realization of the driver to the motor truck industry. Such a vital factor in winning the favor of the motor truck user, as the up-keep and repair expense, is left to be handled by the driver. I have been in a position to make an intensive and comprehensive study of the relation of the driver to the expense of up-keep and repairs, and the gist of my research is this: For any motor truck sold today the driver is responsible for 75 per cent. of the unnecessary expenses.

"What are the reasons for this state of affairs? One cause is the swamping of the market with men, 90 per cent. of whom are not in any way capable so far as their training is concerned. A second cause for the present low standard of drivers is due to the requirements which exist in this state that prospective drivers shall pass a State examination in order to receive a State license. My opinion is that the State examinations do more harm than good because they give the impression that because a man possesses a State license he is a competent and capable driver. The special committee of the Board of Aldermen stated that the effect of the State license upon the standard of the drivers was negligible.

"The third cause I call poor methods in salesmanship of trucks. For example: A salesman is told by a prospect that he does not desire to do away with his old and tried employes who have been driving his teams. The salesman replies that he can make capable motor truck drivers of them in less than a week. The purchaser agrees and the salesman endeavors to carry out his end of the makeshift bargain in an equally makeshift schooling of prospective motor truck drivers, and the owner pays for the deluge of repairs and upkeep expenses which swoop down upon him.

"What is needed at this critical stage is not so much a better car but a better driver.

"I have in mind three requirements as remedies. First, require a guarantee from every driver as to his competency and dependability. To make this guarantee real I believe that the manufacturing interests and motor truck organizations should establish a system of examinations that none but a competent man could pass. Second, require a security of every man's record by a surety company of recognized standing. Third, require a bond to be furnished by each driver of at least $500. This would not be without precedent, because the drivers of every truck of one large express company are required to furnish bonds for from $1,500 to $3,000."

J. WALTER SCOTT BECOMES GENERAL MANAGER OF THE "COMMERCIAL CAR JOURNAL"

Owing to the rapid growth of the commercial car industry in general, and the "Commercial Car Journal" in particular, a reorganization of the business department of this publication was deemed necessary. The promotion of J. Walter Scott from the position of Detroit district manager of the "Automobile Trade Journal" to general manager of the "Commercial Car Journal" is the logical result of an excellent service rendered for a period of ten years.

J. WALTER SCOTT

There is probably no one in the automobile industry who to-day has a wider acquaintance with the leading men of this trade, or who is better known in the "Automobile Trade Journal" field than Mr. Scott, and in his new position as general manager of this publication he will be able to contribute much towards its rapid development.

Mr. Scott will continue to make his headquarters in Detroit, and with C. C. McKinney, who will continue as district manager of the Chicago office, and Charles Monroe Smith, who will remain district manager of the New York office, the "Commercial Car Journal" will have one of the ablest and most representative advertising staffs of any journal in this field.

Mr. Scott's successor as district manager of the "Automobile Trade Journal" in Detroit will be C. K. Brauns, who is well and favorably known to the automobile trade in the States of Michigan, Ohio and New York.

Mr. Scott will be pleased to give his personal attention to the firms in the district which he will cover regularly, and to lend assistance to anyone in the industry. Being identified with the automobile business since its inception, he is qualified to fill this most important position to the satisfaction of both the advertiser and publisher, and the promotion will be welcomed by Mr. Scott's many friends.

WISCONSIN TO HAVE MOTOR 'BUS LINE

A company is being organized to conduct a motor 'bus service between Howards Grove, Franklin and Sheboygan, Wis. The round trip will be made three times a week, and freight as well as passengers will be carried. Fares will be at the rate of three cents a mile in five cent zones.

NEW YORK SEPARATOR ORDINANCE HALTED

By filing an appeal with the Court of Appeals, in Albany, N. Y., the New York garagemen have secured further respite from installing separators in their garages. The Appellate Division of the Supreme Court held the ordinance valid but the ordinance cannot be enforced until a decision is rendered. Such a decision will not likely be rendered before November.

PARCEL POST WEIGHT LIMIT INCREASED

An order has been issued by the Postmaster General increasing the weight limit of packages from 11 to 20 lbs. in the first two zones, and reducing the rates to fix the postage on parcels in these zones at five cents for the first pound, and one cent for each additional pound. Under this rule the 20-lb. package can be sent for twenty-four cents.

NEW YORK TAXICAB TANGLE

The new ordinance, wiping out private hack stands in New York has caused much delay and trouble. The taxicab operators say that the ordinance favors horse drawn vehicles.

All the prominent hotels have obtained injunctions and continue to do business in the old way. Signs, designating public hack stands and specifying the number of vehicles that are legally intended to occupy the space, have been posted by the city officials.

TO USE MORE PARCEL-POST TRUCKS

Postmaster General Burleson has announced that additional automobiles for the parcel post service will be purchased during this month. The increase of the weight limit is one cause of this.

Personal Items

E. A. Scheu, manager of the Invader Oil Company, has been promoted to the post of sales manager.

F. George Walker has become sales manager and service engineer of the Hartford Auto Parts Company.

Lawrence Hardy has become advertising manager of the Delivery Supervision Company, New York City.

Addison de Groll, recently with the International Motor Company, has associated himself with the Motor Car Company, Baltimore, Md.

E. F. Lake has moved his metallurgical engineering business from Bayonne, N. J., to Detroit, Mich., where he is located at 1453 Waterloo Street.

A. F. Mais, who recently resigned from the Studebaker Corporation, has been employed by the Duplex Power Truck Company, of Charlotte, Mich.

G. W. Harper, formerly Minneapolis representative for the Veerac truck, is now with the Menominee Motor Truck Company, 45 10th St., S., Minneapolis, Minn.

Fred. C. Harrington, formerly with the Peerless and Atterbury companies, has become manager of the truck department of Meyer Abrams & Company, Boston, Mass.

M. W. Bennett, for the past two years vice-president of the International Electromotive Company, has been made vice-president of the Gramm Motor Truck Company, Walkerville, Ont.

Clayton R. Burt, at present general superintendent of the Barber-Coleman Company, Rockford, Ill., after September 1 will be plant manager of the Russell Motor Car Company, Montreal, Canada.

W. J. Sparks, formerly with the Archey-Atkins Company, Indianapolis, Ind., distributors of Hudson cars, has joined the selling staff of the Hudson Motor Car Company, Detroit, Mich.

Geo. Uehlein, president of the Universal Motor Truck Company, has decided that the motor truck business demands his presence in Detroit, and has established his office at the factory, moving from Milwaukee.

A. G. Partridge, assistant sales manager of the Firestone Tire & Rubber Company, Akron, Ohio, is enroute on a six weeks' trip, starting from Chicago, and going into Canada, visiting Winnipeg and Vancouver, then down the Pacific Coast, stopping at Seattle, Spokane, Portland, San Francisco, Los Angeles, Salt Lake City, Denver, St. Louis and every other city in this section of the country where the Firestone Company maintains a branch or agency. Mr. Partridge is expected home the latter part of August. New factory buildings are now under way, which will double the company's output by January 1, 1914.

Financial and Legal

Julian Motor Company, Syracuse, N. Y., filed an involuntary petition in bankruptcy on August 1, 1913.

The Grand Rapids Motor Truck Company, which recently went bankrupt, shows liabilities of $124,239.74 and assets of $110,006.81.

The Security Company, Detroit, Mich., receiver for the Grabowsky Power Wagon Company, is distributing about $45,000 to the creditors, bringing the total dividend to about 50 per cent.

Parker Transmission & Appliance Company, Fulton, N. Y., has been involved into financial difficulties by Hunter Bros., who own a controlling interest in the company, and operations have been suspended.

Walpole Tire & Rubber Company, Walpole, Mass., has been placed in the hands of Robert C. Fisher as temporary receiver, for the purpose of effecting an adjustment of the company's finances. The company has branches in Boston, Chicago and New York City.

Schacht Motor Car Company, Cincinnati, O. John F. Dietz, receiver for the company, has been authorized to pay 20 per cent. of the claims of the creditors of the concern. The creditors number about 250 and the entire amount due is $175,000. Dietz stated informally that the dividend was made in addition to the claims for salaries by people employed by the Schacht concern. He said that from the outlook of the business all debts will be paid and the receivership lifted eventually.

MUNCIE GEAR WORKS TO BE REORGANIZED

The Muncie Gear Works, of Muncie, Ind., have been forced into the hands of a receiver upon the application of E. C. Atkins & Company, of Indianapolis, Ind., who had a claim against the Muncie Company, of $950. Last December T. W. Warner, president of the T. W. Warner Manufacturing Company, which was also interested in the Muncie Gear Works, was induced to come to the aid of the Muncie Company, which was then in tight quarters. Mr. Warner loaned them $25,000 additional working capital and took active management of the company. During T. W. Warner's management the company has made a good showing on the profit side of the ledger, but on account of some of the creditors becoming impatient and tightness of the money market, the trouble above mentioned was precipitated, although the company has orders amounting to $400,000 which would net a very handsome profit, which could be filled within the next six or nine months.

Mr. Warner advises us that the plan which was inaugurated several weeks ago for relieving the company of its obligations has met with considerable approval and will undoubtedly be consummated.

New Incorporations

Steinbrenner Carburetor Company, Buffalo, N. Y., has been incorporated with a capital stock of $100,000, to deal in autos and motor trucks.

Parish-Ferrell Manufacturing Company, Harrisburg, has been organized with a capital stock of $50,000 to deal in motor cars and trucks by Fred C. Ferrell, Cheaney L. Parish and John J. Parish.

The Standard Steel Car Company, Butler and Pittsburg, Pa., is reported as contemplating entering the commercial vehicle field. A factory adjoining the Butler plant and costing $2,000,000 is said to be under way.

National Motor Truck & Manufacturing Company is the name of a new concern promotod by Toledo, Lima and Gibsonburg, O. The company is to manufacture one, two and three ton commercial cars. Frank Lamb, formerly with the Gramm Motor Truck Company, is to be president and general manager.

Trade Changes and Factory News

The Moreland Motor Truck Company, Los Angeles, Cal., will establish an assembling plant at Fourth and Harrison Streets, San Francisco.

Kearns Motor Truck Company, Beavertown, Pa., has been incorporated with a capital of $100,000. The company will make extensive improvements to its factory.

The A. O. Smith Company, Milwaukee, Wis., has transferred the manufacture of the Smith-Mulford disc clutch to the Universal Machinery Company, of Milwaukee.

The Willys-Overland Company has secured a twenty-one-year lease on a plot of land at 150th Street, New York. The owner will erect a two-story building, 200 x 148 ft.

General Motors Company, Detroit, is removing the Reliance motor truck plant from Owosso to Pontiac, Mich. The announcement has been expected for some time, as the policy of the General Motors Company has been lately to concentrate its plants.

Warner Gear Company, Muncie, Ind., wishes to correct the impression that has gone out among some of the people with whom it is dealing that the Muncie Gear Works, of Muncie, which recently went into the hands of a receiver, is connected with the Warner Gear Company. There is no connection whatever between the Muncie Gear Works and the Warner Gear Company; neither do the two companies have any stockholders in common. The present personnel of the Warner Gear Company is: A. L. Johnson, Pres. and Director; W. E. Hitchcock, Vice-Pres. and Director; R. P. Johnson, Gen. Mgr. and Director; J. E. Johnson, Secy., Treas. and Director; T. F. Rose, Director; E. B. and F. C. Ball, Directors.

Conventions of Interest to the Trade

August 19-23—at Minneapolis, Minn. Society of American Florists; John Young, Secretary, 54 W. 28th St., New York.

August 25-30—at Cincinnati, O. (Hotel Sinton). National Association of Retail Druggists; T. H. Potts, Secretary, 122 South Michigan St., Chicago, Ill.

September—at Chicago, International Congress of Refrigeration and American Association of Refrigeration; J. F. Nickerson, Secretary, 431 South Dearborn St., Chicago, Ill.

September 9-12—at Chateau Lauvier Hotel, Ottawa, Can. Master Car and Locomotive Painters' Association of U. S. & Canada. Secretary, A. P. Dane, Reading, Mass.

September 17-18—at Cleveland, Ohio. National Paving Manufacturers' Association. W. P. Blair, Secretary, 824 B. of L. Engineers Bldg., Cleveland, O.

September 17-19—at Burlington, Vt. Annual Convention of the New England Section of the National Electric Light Association, to be held at Hotel Vermont.

September 22-24—at Chicago, Ill. American Meat Packers' Association; Geo. L. McCarthy, Secretary, care of *The National Provisioner*, New York.

September 22-26—at Buffalo, N. Y. The National Association of Master Bakers' Convention is to be held at the Hotel Statler; Chas. E. Abbott, 236 8th Ave., N. Y. City, Secretary.

September 24-25—at Atlantic City, N. J. National Association of Cotton Manufacturers. C. J. H. Woodbury, Secretary, 45 Milk St., Boston, Mass.

September 29-October 4—at Detroit, Mich. Third Annual American Roads Congress; F. Ed. Spooner, Secretary Publicity Committee.

September 30-October 1-2—at Hotel Radisson, Minneapolis, Minn. National Paint, Oil & Varnish Association. F. P. Cheesman, Secretary, 100 William St., New York City.

October 2-4—at Atlantic City, N. J. (Hotel Shelburne). United States Brewers' Association; H. F. Fox, Secretary, 109-111 E. 15th St., New York City.

October 13-17—at St. Louis, Mo. Carriage Builders' National Association; H. C. McLear, Secretary, Mt. Vernon, N. Y.

October 14-16—at New Orleans, La. Grain Dealers' National Association.

October 14-17—at Chicago. American Institute of Metals; Secretary, W. M. Corse. Lumen Bearing Co., Buffalo, N. Y.

October 14-17—at Buffalo, N. Y. Convention of the American Foundrymen's Association.

October 15-17—at Richmond, Va. American Gas Institute; Geo. G. Ramsdell, Secretary, 29 W. 39th St., New York City.

October 21-25—at New Orleans, La. International Association of Electrotypers; R. J. Wilhelm, Secretary, 64 South Division St., New York City.

October 21-25—at New Orleans, La. United Typothetae of America; F. W. Heath, Secretary, 1650 Transportation Bldg., Chicago, Ill.

October 24—at Chicago, Ill., American Iron & Steel Institute; James T. McCleary, Secretary, 30 Church St., New York City.

October 31-November 4—at New York (Museum of Natural History), National Association of Gardeners, M. C. Ebel, Madison, N. J.

December 1-6—at Philadelphia, Pa. National Commercial Gas Association. Secretary, Louis Stotz, 29 W. 39th St., New York City.

December 3—at Chicago, Ill. National Association of Furniture Manufacturers. Secretary, J. S. Linton, Ashton Building, Grand Rapids, Mich.

January 14, at Hotel Astor, New York City. National Boot and Shoe Manufacturers' Association. Sol Weil, Secretary, Rochester, N. Y.

Fire Association

August 25-27—at West Haven, Conn. State Firemen's Association. W. Chas. Darby, Secretary.

August 27—at Bayshore, L. I., N. Y. Suffolk County Volunteer Firemen's Association Tournament. M. W. Drake, Secretary.

September 1-6—at New York City. Fire Chiefs' Association 41st annual convention; Exhibits will be found at Madison Square Garden; Jas. McFall, Secretary, Roanoke, Va.

September 11-13—at Weymouth, Mass. Weymouth Agricultural and Industrial Society will hold 49th Annual Exhibition.

September 15-20—at Kansas City, Kan. State Firemen's Association.

September 24-26—at New Bedford, Mass. Massachusetts State Firemen's Association. D. Arthur Burt, Secretary, Taunton, Mass.

October 13-18—at Philadelphia, Pa. National Fire Prevention Conference; Powell Evans, Chairman, Room 420, City Hall, Philadelphia.

The list of conventions given herewith is published each month so that commercial car manufacturers can communicate with the proper authorities with the idea of arranging to give lectures, illustrated talks, statistics, etc., to show the advantage of motor trucks in these various lines; also possibly to show and demonstrate their cars.

State Conventions and Fairs

August 19-22—at Cortland County, N. Y. Cortland County Fair; W. J. Greenman is Secretary.

August 26-28—at Lowville, N. Y. The Lewis County Agricultural Society will hold Exposition and Fair. Captain Thos. S. Baldwin is managing the event.

August 26-29—at Norwich, N. Y. Chenango County Agricultural Society will hold Annual Fair. L. D. Smith, Secretary.

August 26-29—at Norton, Kan. Annual Fair of Norton County Agricultural Association; M. F. Garrity, Secretary.

August 26-29—at Ellenville, N. Y., Ulster County Agricultural Society will hold Annual Fair.

August 26-30—at Hamburg, N. Y. Erie County Agricultural Society, W. E. Taylor is Secretary.

August 28-29—at Helena, Mont. Helena Flower Show Association; Dr. L. M. Rheem, Secretary of Commercial Club, is interested.

August 28-29—at New Hartford, N. Y. Central New York Horticultural Society will hold show. H. S. Weaver, Secretary.

September 1-3—at Norwich, Conn. Annual Exhibit of the New London County Agricultural Society at grounds at East Great Plain.

September 1-5—at Chatham, N. Y. Columbia County Fair, under auspices of Columbia County Agricultural Society. W. A. Dardiss, Secretary.

September 1-5—at Orangeburg, N. Y. Rockland County Fair, under auspices of Rockland County Agricultural and Horticultural Association.

September 2-5—at Hartford, Conn. Connecticut Fair Association will hold State Fair at the Charter Oak Park Fair Grounds. John I. Dower is President.

September 3-13—at San Jose, Cal. Retail Grocers' Association Show; A. F. Emlay, Secretary.

September 8-11—at Herkimer, N. Y. Herkimer County Agricultural Society will hold Fair.

September 8-12—at Milwaukee, Wis. State Fair by the Wisconsin State Board of Agriculture.

September 8-13—at Syracuse, N. Y. New York State Fair. M. A. Bowen, Publicity Secretary.

September 9-12—at Wilmington, Del. Delaware State Fair, at Wawaset Park.

September 10-11—at New York City. Annual State Convention of Master Bakers, to be held in Arion Hall.

September 11-13—at Mankato, Minn. State Fair, under auspices of Mankato Fair Association; Charles T. Taylor is President.

September 16-18—at Manchester Centre, Vt. Battenkill Valley Fair.

September 16-19—at White River Junction, Vt. Vermont State Fair. F. L. Davis, Secretary.

September 16-18—at Gorham, Me. Cumberland County Agricultural and Horticultural Society will hold Fair.

September 16-19—at Ottawa, Kan. Franklin County Agricultural Society will hold fair. R. J. Finley is Secretary.

September 17-19—at McAlester, Okla. Pittsburgh County Fair.

September 18-20—at Newark, N. Y. Annual Fair of the Newark Fair Association.

September 22-23—at Chicago, Ill. Sherman Hotel. Secretary, Chas. E. McNeill, 71 W. S. Water St., Chicago, Ill.

Sept. 22-26—at Pittsburgh, Pa. Illuminating Engineering Society. Chairman, C. A. Littlefield, 55 Duane St., New York City.

September 22-27—at St. Joseph, Mo. Fair under auspices of the St. Joseph Interstate Fair Association. Headquarters at 5th and Francis Sts. W. W. Cole, Secretary.

September 22-27—at Boise, Idaho. The Idaho Intermountain Fair Association will hold fair at the Association's grounds, William Krull, Secretary, 297 McCarty Bldg., Boise, Idaho.

September 23-25—at Mercer, Pa. Annual Fair. Mercer Fair Association.

September 23-26—at Rochester, N. H. Rochester Agricultural and Mechanical Association will hold fair.

September 23-26—at Minneapolis, Kan. Ottawa County Fair Association will hold Fair. J. E. Johnson, Secretary.

September 23-27—at Hope, Ark. Hempstead County Union Fair. R. H. Ethridge, Business Manager.

September 23-October 4—at Oklahoma City, Okla. Seventh Annual State Fair and Exposition; J. S. Mahan, Secretary.

September 24-27—at Mt. Kisco, N. Y. West Chester County Agricultural and Horticultural Society, Inc., will hold Fair.

September 25-27—at Palmyra, N. Y. Annual Fair of Palmyra Agricultural Society.

September 25-27 and October 2-4—at Holyoke, Mass. Third Annual Fair of the South Holyoke Lyceum, to be held in City Hall. T. J. Doherty, Chairman.

September 27-October 3—at Sedalia, Mo. Missouri State Fair; John P. Stinson, Secretary of Fair Association.

September 30-October 2—at Larned, Kan. Pawnee County Agricultural Association will hold Fair; T. C. Wilson, Secretary.

September 30-October 2—at Fredericksburg, Va., 1913 Fair. Rappahannock Valley A. and M. Society; S. B. Quinn, Secretary and Treasurer.

October—Dallas, Texas. Retail Marble and Granite Dealers will convene. A. G. Deatheridge, of Wichita Falls, Texas, is President.

October—at Waterloo, Iowa. Waterloo Dairy Show. Address W. B. Barney, State Dairy and Food Commissioner.

October—at Amherst, Mass. Eastern Hampden Agricultural Society will hold Fair at the Massachusetts Agricultural College.

October 1-3—at Toledo, O. Annual convention of the Vegetable Growers' Association of America. E. A. Dunbar, Secretary, Ashtabula, O.

October 4-11—at Denver, Colo. Electrical and Industrial Exposition, by the Colorado Electrical Club; L. M. Cargo, 1052 Gas & Electric Bldg., is Chairman of Committee.

October 7-9—at Brenham, Tex. Washington County Fair Association will hold Annual Fair; C. A. DeWare is President, and F. H. Dever is Secretary.

October 7-10—at Greenwood, Ark. Greenwood Agricultural Show; Jesse A. Bell, Chairman of Finance Committee

October 8-18—at Wichita, Kan. Third Annual Wichita Fair and Exposition, to be held in the Forum; Walter P. Innes, Manager.

October 13-19—at Chicago, Ill. American Foundrymen's Association will hold convention at La Salle Hotel.

October 21-24—at Wichita, Kan. Business Men's Association preparing for Trans-Mississippi Congress, to be held in Wichita.

October 21-31—at Macon, Ga. Georgia State Fair; M. V. Calvin, Secretary.

October 22-November 1—at Tulsa, Okla. Eighth Annual Session of Congress & International Soil Products Exposition.

November 18-20—at Louisville, Ky. Maintenance of Way, Master Painters' Association. Wm. C. Wilson, Secretary, 149 Beacon St., Middletown, N. Y.

December 9-12—at Philadelphia, Pa. Tenth Annual Convention of American Road Builders' Association, to be held at First Regiment Armory Building. E. L. Powers, 150 Nassau St., New York City, Secretary.

December 9-13—at Harrisburg, Pa. Central Pennsylvania Poultry Association will hold exhibition; C. S. Smith, of West Fairview, is Show Superintendent.

December 10-12—at Milwaukee, Wis. Wisconsin Retail Implement and Vehicle Dealers' Association; G. F. Borchardt, South Milwaukee, Wis., President.

February 9-14—at Baltimore. Retail Hardware Association of Maryland, Pennsylvania, Delaware and New Jersey will hold convention; W. P. Lewis, Huntingdon, Pa., is Secretary.

December 11-20—at New York City. First International Exposition of Safety and Sanitation, under auspices of the American Museum of Safety, 29 W. 39th St., New York City.

Chicago will attempt to secure lower taxicab fares and hire rates. Mayor Harrison promises to have the situation investigated before the adjournment of the City Council.

On July 28 the first all night motor omnibus service was started in London, between Liverpool Street Station and the Crown Hotel, Cricklewood.

THE COMMERCIAL CAR JOURNAL

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COMMERCIAL CARS SHOULD OPERATE UNDER FEDERAL LICENSES

Interstate Taxing of Trucks Should Be Abolished

ALTHOUGH there is a question as to placing the touring automobile under the heading of a common carrier as provided for in Interstate Commerce regulations, there should be no such question concerning the commercial car, which is truly an interstate carrier.

The laws of this country have from the beginning been framed to reduce to the minimum the restrictions which any individual State might impose on the interstate commerce. With this idea as a basis, and with the laws interpreted with this idea in mind, free trade in the broadest sense now exists between the States.

The retaliatory laws and regulations which have been indulged in by one State against another, are exactly contrary to our Interstate Commerce ideas, and have done much to prevent the free and extended use of motor driven vehicles. The imposing of heavy taxes on automobiles and trucks from an adjoining State is contrary to the spirit of the constitution, and the truck being actually an interstate carrier in many instances, should certainly be exempt from any State legislation which would tend to interfere with its free and unrestricted use.

The action of some of the Southern States in this respect is most unjustifiable, and we are pleased to note that the attitude of certain of these States has recently changed and that laws imposing excessive charges for retaliatory purposes have been repealed.

A Federal license law permitting with a single license the use of all kinds of motor driven vehicles engaged in interstate travel should be the aim not only of every organized club of motorists in the country, but of the business men and their organizations. We believe that trucks should be considered as interstate carriers.

THE INSTALLATION ENGINEER

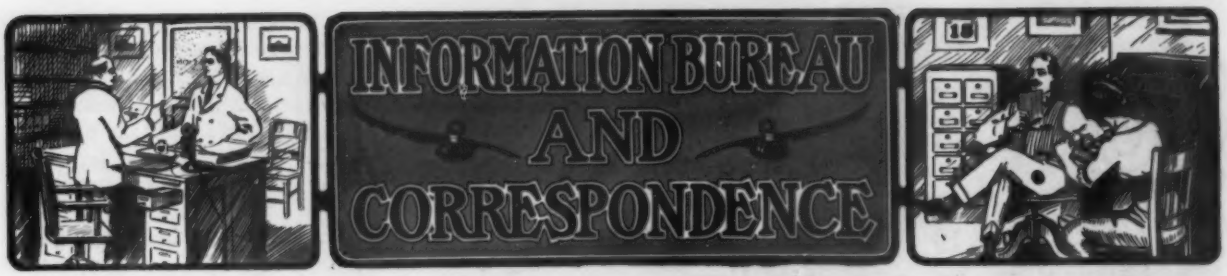
EVERY day it grows more and more apparent that prospective truck purchasers need the guidance, and helpful suggestions of one whose long experience in the handling of delivery and in the supervision of commercial cars fits them to suggest.

This is a fact which is not realized by the ordinary user who cannot realize apparently that he is replacing his simple horse and wagon equipment with an engineering proposition. He cannot see that anything is needed more than would be required were he to purchase a few additional horses and wagons. He does not appreciate that there is a greater difference between commercial motor driven vehicles than there is between wagons, and that a slight error as to the size or kind of equipment may mean a disastrous failure in the use of commercial cars.

Every selling branch or agency tries to have at least one man among its staff who is sufficiently an engineer to diagnose the prospect's business conditions, and give him sound advice as to his truck equipment. Recently one of the largest truck manufacturers has instituted a new department under the direct supervision of a man who is to be known as the "Installation Engineer." The express duties of this office are to study the conditions surrounding any proposed truck installation, and determine the number and size of the units which will best handle the work. For instance, an express company decides to replace its horse drawn vehicles with motors. The company may not have had sufficient truck experience to select motor driven equipment intelligently. The installation engineer goes over the ground, tabulates the data, figures out the exact cost of doing the work by present methods and plans a system for doing the same work with motor trucks, yet without any unnecessary expense. If ten trucks and fifty horses are required, he so recommends, or if fifty trucks and ten horses, he so reports to the prospective user.

This service is entirely free to the customers and is an innovation which should be followed by every truck maker in the country.

"Unused advantages are no advantages,"---use trucks



IS THE TRUCK BUYER BEING SOLD RIGHT?

To the Editor:—

The same issue of the Commercial Car Journal, June 15th, contained two articles which had a singular relation to each other. One of these, by "A Truck Salesman," points with perfect justice to the difficulty in educating the owner to the proper use of trucks, while an editorial on the "Publisher's Personal Page," points to the means which the owner should employ to ensure the profitable use of motor trucks—namely, a mechanical record of all delays.

"Truck Salesman" seems, however, to put the blame of the matter on the buyer, whose lack of knowledge about motor trucks is, to be sure, an appalling problem. In his summary he says "the prospect has not bought right in the past, nor is he buying right at present." True; but is he being sold right at present, or has he been?

A motor truck paper contained last month a comparative statement made by a prominent truck company, showing the superiority of their motor trucks over horse-drawn equipment. In this the following paragraph appeared:

"In considering these figures, it should also be taken into account that the 10,656 miles covered by this truck is small mileage for a truck of this weight. Driven in accordance with most city ordinances, this truck, exclusive of stops, would make 12 miles an hour, or 96 miles a day, if driven continuously for eight hours. Figuring on 312 working days, this would bring the annual mileage to 29,952."

This company must surely know that the percentage of trucks which drive continuously for eight hours a day at 12 miles an hour is not one in one thousand. Is this the sort of figuring to justify the appeal of "Truck Salesman," that the buyer "must learn to trust the men making and selling trucks?" This is unfair to the buyer and to the truck.

The fact is that the average motor truck is on the road, in actual motion, less than 30 per cent. of the total time it is in service each day, or 50 per cent. at least, of the time it should run, after reasonable allowance has been made for loading and delivery.

Even the motor truck salesman, appreciating as he does that there is frequently a costly delay, does not realize that it is so big or so universal.

The above statement is based on time studies, made with travel recorders, in more than fifty installations. Graphic charts of a few of these illustrate some of the abuses which have made the use and selling of trucks unsatisfactory.

Figure A represents a three-weeks' test in the service of a company which has a shuttle-haul—from the factory to the freight depot and back (theoretically, a very easy type of service to supervise and keep efficient.)

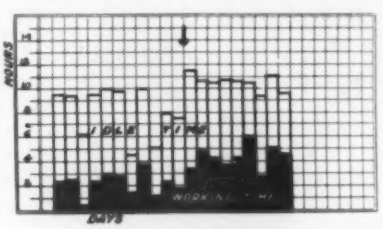


Fig. A

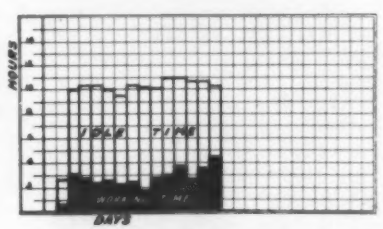


Fig. B

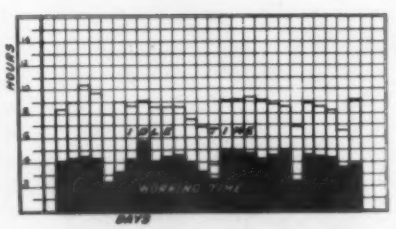


Fig. C

The first two weeks (up to the arrow point) were devoted to study of conditions, without any attempt at improvement. The shipping department was then called to account for delays, and the steady gain in running time was paralleled by a gain in tonnage until this truck was working at practically ideal conditions, and doing more than twice as much as before.

This is not the truck salesman's fault, of course. But the next illustration may contain a suggestion to the conscientious motor truck man.

Figure B is a record of the work done by the "best" truck in a heavy-tonnage inter-factory service. This truck is one of ten, of which it is said to be the busiest. These trucks are so "busy" that ten more have been ordered. The improvement the last four days was caused by "tipping off" the shipping department to its deficiencies.

For comparison, Figure C is from an identical service, in the same city, with same make of truck—the latter, however, being supervised by a travel-and-stop recorder.

It will be apparent that the running time in Figure C is almost double that in Figure B. If these trucks represented by Figure B were driven to the same standard as Figure C, (which is not yet perfect) how many, do you think, of these extra trucks would be needed? And how much more satisfied would the buyer be at the end of the year?

Someone will investigate the number of prospects who have been sold more trucks than they need, and the results will not only amply confirm the editorial in C. C. J., but will throw a big light for the truck maker on the question "What's the Matter with the Motor Truck Business."

W. A. McDERMID, Sales Manager.

WANTS FIFTEEN HUNDRED POUND TRUCK AGENCY

To the Editor:—

I would like the agency for a small truck of not larger than one ton, and of a price not above $1500, as there is a good opening for a line of that kind in Mineola, Tex.

H. O. HOARD, Hoard's Repair Shop.

NEW USE FOR USED CARS

To the Editor:—

We believe we have evolved an idea for the sale of used cars, either commercial or pleasure, which is new.

The day of the horse-drawn fire department apparatus is past. Today any community contemplating the purchase of such apparatus desires to buy motor driven wagons if in any way possible.

So far as I know nearly all, if not all, of the standard combination or chemical wagons now on the market cost from $4,000 up. The average town or small city cannot afford this price.

Here is the Solution

Almost every garage man or automobile dealer has on hand a number of used cars. These cars may be somewhat out of date as to body lines, etc., but the engine, transmission

Two Chemical Wagons From Converted Pleasure Cars

On the left is a Velie used at Gloversville, N. Y., and the other is a Chalmers, at Seamore, Conn. The cost did not average over $1600 each

and similar parts, in many cases, are in first class condition, just as good, if not better, than the day they left the factory. In a number of cases, cars of this description have been remodeled and at a comparatively small expense converted into combination or chemical wagons and sold as such to the town where the dealer or garage man lives, and at a price much lower than the cheapest price at which apparatus could be bought.

The service of a chemical wagon or a combination hose wagon is in no sense similar to the conditions or service of an ordinary commercial car. The load of a chemical wagon is a fixed quantity and not subject to the severe condition of overloading always so common in ordinary commercial service. For instance a chemical wagon carries its own equipment, the weight of which is a fixed quantity. It is not used day in and day out, but only at infrequent intervals, particularly in the smaller towns where the fire alarm is not by any means a daily occurrence.

The accompanying cuts illustrate two cases of this kind: One shows a Chalmers chassis purchased by the town of Seamore, Conn., and the other a Velie chassis purchased by Gloversville, N. Y. The approximate cost of these wagons was $1600. In another case a Ford runabout was used at a total cost of about $900.

We are now equipped to furnish the proper chemical apparatus for such wagons. This apparatus is the same in design and construction as is now used by all the large city fire departments.

We can furnish it in any size or arrangement desired, and include the necessary chemical tanks, special fire department extinguishers, hose, reels or baskets, ladders, water main connections, etc.

O. J. CHILDS COMPANY, Utica, N. Y.

Steel and Rubber Market

Steel Market Quiet

The small manufacturing plants throughout the country are showing activity. New business with the Steel Corporation and some of the independent manufacturers is still slight, the orders scarcely averaging more than 35 per cent. of total capacity. Prices quoted on August 11th were:

STEEL PRODUCTS PRICES

Bessemer steel, per ton, mill	27 00 a ....
Open hearth, per ton, mill	27 00 a ....
Sheet bars, per ton	27 50 a ....
Steel bars, soft base, half ex., tidewater	1 56 a ....

The above prices are at tidewater in carloads and larger lots. For quantities less than 2,000 lbs., but not under 1,000 lbs., $2 00 per ton additional is charged, and less than 1,000 lbs., $8 00 per ton, additional.

SHEETS

The following prices are for 100-bundle lots and over f. o. b. mill; smaller lots $2 00 per ton higher.

Gauge—	Black.	Galvanized.	Gauge—	Black.	Galvanized.
Nos. 22 & 24	2 10	3 05	No. 28	2 25	3 35
Nos. 25 & 26	2 15	3 15	No. 29	2 30	3 50
No. 27	2 20	3 25	No. 30	2 35	3 70

IRON AND STEEL AT PITTSBURGH

Bessemer iron	16 40 a ....
Bessemer steel, f. o. b. Pittsburg	26 50 a27 00
Muck bars	31 00 a31 50
Skelp, grooved steel	1 45 a 1 50
Skelp, grooved iron	1 70 a 1 75
Ferro-manganese (80 per cent.), seaboard	57 50 a58 50
Steel, melting scrap	12 50 a13 00
Steel bars	1 40 a 1 45
Black sheets, 28-gauge	2 25 a 2 30
Galvanized sheets, 28-gauge	3 25 a 3 35
Blue annealed, 10-gauge	1 65 a 1 75
Tank plates, ¼-inch and heavier	1 45 a ....

Rubber Market Firmer

Rubber gained a few points since our last writing. Trading, however, continues on a small scale here and abroad. On August 11th quotations were:

Up-River—	
Fine	94 a ..
Coarse	52 a 53
Island Fine—	
Coarse	30 a 31
Cameta	37 a 38
Caucho—	
Ball	52 a ..
Centrals—	
Corinto	52 a 53
Esmeralda	52 a ..
Guatemala, slab	43 a 44
Mexican—	
Scrap	54 a ..
Strips and scrap	53 a 54
Guayule	Nominal
Balata, sh't.	69 a 70
Ciudad, b'k.	48 a 49
Trinidad, b'k.	Nominal

Africans—	
Massel red.	65 a 66
Red C'go.	Nominal
B'k C'go.	65 a 66
Soudan—	
Niggers	Nominal
Accra, lbs.	34 a 35
Gambia, prime	51 a 52
East India—	
Smk. sh'ts.	51 a ..
Ceylon, bis. and sh'ts.	69 a 70
Pale crepe	70 a 71
Borneo I	58 a 59
Borneo II	46 a 47
Borneo III	30 a 31
Pontianac—	
Pontianac, Prime plantation	6 a ..
Palembang	5 a ..

DOMESTIC

Boots and shoes	9¼a 9¾
Tires—	
Automobile	9½a 10
Bicycles, pneumatic	5 a 5¼
Wagon and carriage, solid	9 a 9¼

FOREIGN

Foreign cut goloshes	7¼a ..
Automobile tires, plain	10½a 10¾
Bicycle tires, with beads	3½a 4
Tender hose	3 a 3½
Mixed drab	9 a 9½
Mixed white	12½a 20
Red mixed	9¾a 10¼

Commercial Car Parade in Philadelphia

Greatest Procession of Its Kind Ever Held

Six Hundred and Twenty-seven Trucks of all Sizes and Descriptions Parade Through Business Center. Almost Every Conceivable Business or Industry Requiring a Delivery Service Was Represented

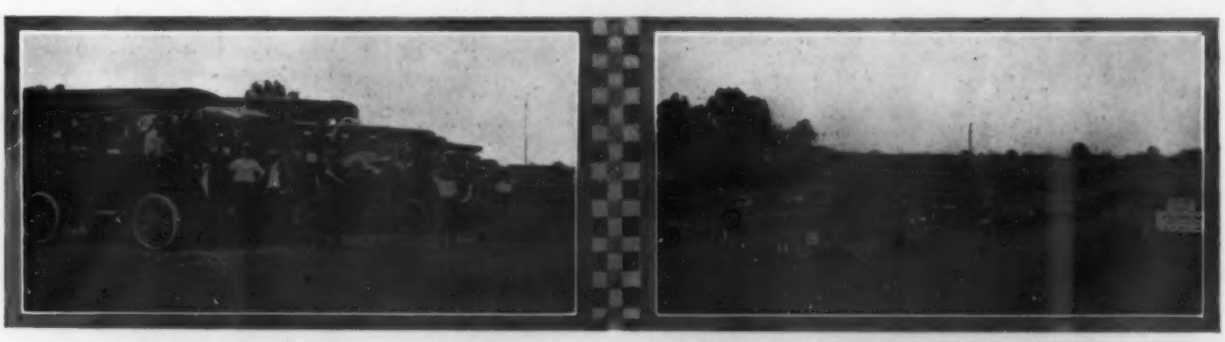
THE third annual motor truck parade, which was held on Thursday, July 31st, at Philadelphia, under the auspices of the *Philadelphia Inquirer*, proved to be one of the most remarkable displays of its kind ever held, both from a spectacular as well as business standpoint. Merchants and manufacturers from all points of the city entered their machines, some carrying specially gotten up displays, while the majority hauled usual daily loads, which were delivered after the parade broke ranks. Trucks of all kinds were in line from heavy 14,000-lb. capacity machines which formed the first division of the parade, down to the 1500-lb. and less class, which constituted the sixth or last division.

The parade proved beyond a doubt the rapid strides and progress made by Philadelphia merchants and manufacturers in revolutionizing their delivery service. The parade was over two miles in length, and was divided into six divisions. The various divisions lined up on South Broad Street, and at about 10.30 the start was made. From the very start to the end there was not a hitch in delay or formation, and for nearly two hours the long procession wended its way through the principal business streets in the center of the city. Each division carried a different colored pennant, thus making it an easy matter for the various trucks to keep their divisions and in proper line. The first division was devoted to trucks having a capacity of 7000 lbs. and up, and it was in this division that spectators found much to marvel at. There were trucks constructed to transport oil, others for drawing monster girders; coal trucks, storage trucks, dumping body trucks and a score of others. The second division was composed of trucks from 4000 to 6900 lbs. capacity; the third was made up to trucks from 3000 to 3900 lbs. capacity, while the fourth division included trucks from 1600 to 2900 lbs. In the latter division, as well as in the fifth and sixth divisions, a score or more trucks were entered by one concern. Many of the large department stores entered from ten to twenty trucks, all loaded with goods to be delivered. Some of these trucks were exhibited at the Park for two or three hours, and then made their deliveries. The sixth division was composed exclusively of electrics of various capacities.

All along the route of the parade business houses and stores were gaily decorated with flags. From office windows merchants and manufacturers saw the wonderful development of the motor driven vehicles as a commercial necessity. A very striking contrast between the horse drawn vehicle and the commercial car was witnessed on Market Street. A 16 horse team was drawing a heavy dynamo on a wagon along the south side of the street in the car tracks. Drivers cracked their whips as the horses strained under the task, while at most cross streets traffic was held up for a few minutes while the team passed. While the horses were struggling with the load two large trucks approached the team, one carrying an immense boiler, appearing to weigh heavier than the dynamo, and the other a huge flywheel and several other heavy articles. The ease with which the commercial cars handled their loads in comparison with the horse drawn outfit was appreciated by hundreds.

Parades, as a rule, are preceded by a platoon of mounted police, but not with this one. Instead, this modern record-breaking pageant was headed by an honorary escort of motorcycle policemen. It was not a slow moving affair by any means, the trucks following one another closely all along the line.

Regular merchandise carrying vehicles were not the only ones in line. The number of cars especially adapted for a purpose was surprising. A truck used in the quartermaster's department of the United States Marine corps, and a truck used in the quartermaster's department, N. G. P., were in line, together with motor patrols, high pressure fire engines, ambulances, hearses, electric trucks used especially for trimming lamps, and electric baggage trucks used in railway stations.



Autocar Company's Trucks Exhibited at Schuetzen Park; Also a Partial View of Exhibit Grounds

Scenes En Route The Philadelphia Inquirer Truck Parade

1. The Knox-Martin Tractor, pulling a five-ton boiler. The ease with which this vehicle handled its load caused much comment. 2. One of the bands which accompanied the parade to Schuetzen Park, at Tabor. 3. The Baker-Bell Gearless Drive exhibit. 4. The parade on North Broad Street, en route to the exhibition grounds. 5. Lining up on South Broad Street, before the start. 6. Some of the electrics exhibited at Schuetzen Park. 7. An impromptu baseball game. 8. and 9. The parade passing down Market Street and through Philadelphia's main business section.

The Exhibit at Schuetzen Park

After traversing all of the downtown business section, the trucks which were scheduled to be exhibited at Schuetzen Park made a record run up Broad Street to the exhibit grounds. Here hundreds of prospective purchasers examined the various trucks shown. Demonstrations were made by some of the exhibitors of dumping body trucks, etc.

One of the most effective methods in parking the hundreds of motor trucks after the parade was followed. Without the least disorder or loss of time, the machines chugged up the street incline into the park, rounded a course mapped out by white flags, and took their position. Other white flags told the drivers the way to take their trucks to their allotted positions. *Inquirer* representatives personally aided by directing the exhibitors to their positions. When the last of the trucks had been assigned and taken up its position, the field looked not unlike the grounds encircling a circus menagerie.

The impetus to the motor truck industry given by the preceding parade was increased a thousand fold by the Schuetzen Park display. Perhaps one of the most striking incidents of the day, the one which perhaps impressed interested spectators as much as any during the day, occurred when the great trucks entered the park.

From Tabor Road to the park entrance there is a steep hill, a hill which is lined with high embankments upon either side, and which would not brook a turn. One after the other the trucks negotiated the incline.

A truck carrying a long telegraph pole ascended the hill, and made the turn at the top and settled into its position in scarcely longer time than it takes to tell about it. A similar pole, pulled by horses, would have only reached the summit after tugging and whippings and shoutings from the drivers in perhaps half an hour.

The bounteous way in which *The Inquirer* provided for the display was amply demonstrated within a few minutes after the time the last of the exhibitors had reached the grounds. To every demonstrator was given a buffet luncheon ticket, in fact practically every person on the ground at that hour was the special guest of *The Inquirer* at the meal.

Officials in Charge of Parade

In addition to Chief Marshal Eastman the following well-known automobile men acted as officials of the parade:

First assistant chief marshal, W. F. Roth, Packard Motor Company; second assistant marshal, Ralph Cook, Peerless Motor Company.

First Division—Marshal, A. M. Pearson, Locomobile Company of America; first assistant, S. Aarons, Peerless Motor Company; second assistant, H. L. Cooper, International Motor Company.

Second Division—Marshal, James Joyce, Kelly-Springfield Motor Truck Company; first assistant, W. Eldredge, The Eldredge Company; second assistant, George A. Wiley, Bigelow-Wiley Motor Company.

Third Division—Marshal, O. E. Stoll, G-M-C; first assistant, F. M. Gardiner, American Locomotive Company; second assistant, D. O. Eaton, Autocar.

Fourth Division—Marshal, Robert Howley, The White Company; first assistant, M. E. Mills, The Rowe Motor Manufacturing Company; second assistant, F. B. Massey, Baker-Bell Motor Company.

Fifth Division—Marshal, J. E. Gomery, Gomery-Swartz Motor Company; first assistant, L. H. Wessell, Chase Motor Company; second assistant, H. Lansdale, Krit Motor Company.

Sixth Division—Marshal, E. S. Hare, Commercial Truck Company; first assistant, C. O. Raynsford, Packard Motor Company; second assistant, C. Haines, Baker Electric Company.

The general committee which had the parade in charge was composed of W. H. Metcalf, chairman, Woods Electric Garage; W. H. Patton, General Motor Company; P. Russell, Buick Motor Company; F. E. Browning, White Motor Company; C. A. Spencer, Autocar Sales and Service Company; F. Von A. Cabeen, Jr., American Locomotive Company, and J. W. Hennesy, of the International Motor Company.

PAVING BRICK MANUFACTURERS TO VIEW ACTUAL OPERATIONS

The National Paving Brick Manufacturers' Association will hold its annual convention at Cleveland, O., September 17th and 18th, and the committee in charge of the convention has made arrangements with the engineers of the city of Cleveland, and also with the state and county highway officials to view the large amount of construction work which is being done on the roads of Cleveland and Cuyahoga County. It is stated that 1000 miles of brick paving have been put down in this territory during the past few years. The headquarters of the Association during the convention will be at the Statler Hotel.

A bond issue of $1,500,000 has been floated in New York by the Mitchell-Lewis Motor Car Company. The concern plans shop extensions.

The Motor Truck Club, of Boston, has been organized by D. C. Fenner, president of the New York Club.

A Three and a Half Ton Gramm Chassis Fitted With Power Dump Body

This truck is manufactured by the Gramm-Bernstein Company, of Lima, Ohio, which has added a one-ton and a five-ton model to its present line. This company has just closed an order of three hundred trucks, to be delivered during a period of three years.

New Agencies and Branches

B. & B. Motor Company, Birmingham, Ala., has taken the agency for the G. M. C. truck.

Goldman, Eugene, 1376 E. 63rd St., Chicago, Ill., has taken the agency for the Avery truck.

Service Motor Car Company, of Wabash, Ind., has opened a branch at 1623 Michigan Ave., Chicago, Ill.

The Gerlinger Motor Company, Portland, Ore., opened a branch at Broadway and Pike Street, Seattle, Wash.

Chicago Pneumatic Tool Company, Chicago, Ill., has opened a branch at 1740 Market St., Philadelphia, Pa.

The California Moline Plow Company, Los Angeles, Cal., distributors of International trucks, has secured the Carter-car agency.

Doyle's Sons, Austin, Chicago, Ill., have taken the agency for the Star trucks, manufactured by the Star Motor Car Company, a $50,000,000 corporation of Ann Arbor, Mich.

Koehler, H. J., S. G. Company, New York City, has appointed the following agencies to handle the Koehler commercial car: Capitol Motor Car Company, Providence, R. I.; Jefferson Garage Company, Syracuse, N. Y.; Lloyd Bros., Muncy, Pa.; W. Monroe Hancock, Madison, N. J.

Pittsburgh Machine Tool Company, Braddock, Pa., has recently established an agency for the sale of the Curtis Motor Truck in New York City under the name of the Curtis Motor Sales Company. Salesrooms are located on Broadway, at 57th St. and the agency is in charge of Messrs. R. W. Friday, Chas. H. Succop and H. J. W. Foster.

Maxim Tricar Manufacturing Corporation, New York City, has closed with the British Motor Depot at Copenhagen for its agency in Denmark, with the New York Garage (L. Bousquet & Cie) for the agency in France; with A. C. Vanderpoel, of 18 Broadway, formerly with the Ford Motor Car Company, for the management of its export trade.

Siegmund-Baylies Truck Company, 2029 S. Michigan Ave., Chicago, Ill., has been organized by Geo. Siegmund and Harry L. Baylies to handle the Dart motor trucks of 1,000 lbs., one and two-ton capacity. The company signed for territory within sixty miles of Chicago and sixty miles of Milwaukee and a few counties in northern Indiana.

Interstate Motors Company, San Francisco, Cal., has changed hands and management. S. M. Wilson, well known in San Francisco business circles, has entered the automobile business. He has secured for the Interstate Motors Company a valuable line of cars and trucks, which he intends to push with the greatest possible energy. To this end he has secured as sales manager D. Y. Iddings. This company, being a factory branch, will carry a full line of parts for all cars it handles, as well as a service station for the benefit of its customers.

Huselton Automobile Company, 515 N. Washington St., Butler, Pa., has opened an up-to-date automobile supply and accessory shop at 150 N. Main St. The company still conducts a garage and repair shop at the Washington St. address, which shop is devoted to the building of trucks. These trucks are being built by the Huselton Motor Company and are called the "Butler Truck." They are made up of such parts as the Continental motor, Timken axles, Bosch magneto, and are fitted with pneumatic tires, 35 x 4½ in. They have a carrying capacity of 1500 lbs.

Personal Items

Arthur J. Steele has joined the Philadelphia truck sales force of the American Locomotive Company.

J. P. Nicholson, former district representative of the Service Motor Car Company, is now manager of its Chicago branch.

H. C. Whitney has resigned from the Atlanta, Ga., branch of the American Locomotive Company.

Frank Shaw, of Memphis, Tenn., has been appointed manager of the Dallas, Tex., branch of the Maxwell Motor Company.

O. E. Stoll, a former Detroiter, has been appointed manager of the Philadelphia branch of the General Motors Truck Company.

J. A. Mraz, Chicago representative of the Chase Motor Truck Company, has been made distributor of the Republic truck in the Chicago territory.

A. S. Holly, formerly manager of the Kelly-Springfield Motor Truck Company's New York branch, has become Boston manager for the Packard company.

R. F. Ketchum, formerly manager of the Mack Motor Truck Company of Boston, has been appointed manager of the Boston branch of the R. & L. Company.

A. F. Masury, formerly factory manager of the Hewitt Company, also with the General Sales Department of the International Motor Company, has been appointed New York Service Manager for the new eight story Service Station, 63rd to 64th Street on West End Avenue, New York City.

C. A. Hawkins, who has been manager of the White Company's San Francisco branch office ever since the well-known Cleveland motor company has been marketing cars on the Pacific Coast, has tendered his resignation to take effect on Aug. 15th. Mr. Hawkins has large business interests on the coast, and decided to resign because he felt he could not do justice to the White Company's business and at the same time look after his own. He has built up an extremely large business in White trucks and cars on the Pacific Coast, and while his resignation was not unexpected, it is a distinct loss to the White Company.

STEWART-WARNER SUBSTITUTE SERVICE STATIONS FOR BRANCHES

One hundred and fifty service stations, which will carry a full stock of instruments and parts, and will have all the necessary equipment for repair work and installations, will be substituted by the Stewart-Warner Speedometer Corporation of Chicago, Ill., for twelve branch houses. The company believes that it can better serve the trade's requirements by this system than by the old.

A BOOK ON ELECTRIC STARTING AND LIGHTING SYSTEMS

Any truck owner, who will send the necessary stamps can obtain "A Handbook on Automobile Electric Starting and Lighting Systems," which the publishers say is the most complete and practical treatise on the construction, care and operation of these systems that has ever been compiled. This book is not an advertisement, but gives information on every system on the market. It was written by experienced engineers and can be relied upon to be correct. Included is a chart, which will aid in tracing troubles and will show how to remedy them.

The Autocar Company, Ardmore, Pa., has published a new catalogue giving a description of its truck chassis and illustrating and giving prices of numerous styles of bodies, special lettering and extras.

CCJ GALLERY of SALES MANAGERS

S.E. BARNWELL —
ELECTRIC VEHICLE DEPT. —
KENTUCKY WAGON MFG. CO.
THIS IS A REAL AMESBURY CHAIR. "STEVE" BUILT IT. (SOME HEFT)
AT THE DEALS BALL
RUM TUM
"STEVE" BARNWELL SELLS TRUCKING TO THE TUNE OF A MANDOLIN.

SAMUEL J. ROWE —
ROWE MOTOR MFG. CO.
THIS ISN'T SAM ROWE'S REGULAR JOB. HE'S PRESIDENT — HIS COMPETITORS HOPE HE WILL GO BACK TO HIS "REGULAR JOB"

L.E. VIERS —
INTERNATIONAL HARVESTER COMPANY OF AMERICA.
VIERS DEVELOPES SOME SPEED JOGGING UP HIS 87 I.H.C. BRANCH HOUSES...
I.H.C. BRANCH
I.H.C. BRANCH

B.O. ROGERS —
ACME UNIVERSAL JOINT MFG. CO.
NOW THEN — IS THE RESISTANCE TORQUE IS NOT EQUAL TO THE TENSIL STRENGTH — ETC - ETC ETC.
I ADMIT IT.
NO FISHING ALLOWED
ALL IN
THAT SCIENTIFIC STUFF CERTAINLY FLOORS 'EM. HE MUST HAVE TRIED IT ON THE FISH WARDEN.

The Commercial Car Driver, and His Importance in the Success or Failure of Motor Delivery

Who Makes the Best Driver? Should Drivers Make Repairs? The Bonus System

By E. S. FOLJAMBE

HE importance of the commercial car driver in the success or failure of any motor installation cannot be overestimated, a fact not sufficiently realized by the average owner. We have perhaps, as a reason, the old traditions for years schooled into the mind of the business man, that the driver is more or less an unimportant factor; that he is merely a man to load and unload a wagon and drive a horse, that he can be replaced at any time without difficulty at small expense, and that there are hundreds of good men willing to take his place. This is doubtless largely true when horses constitute the delivery system, but when horses are replaced with delicate machines, and engines which have to be handled in an entirely different manner, the importance of the driver immediately takes a step forward, assumes a higher plane in the pyramid of the working forces of the company, and this is true even though the same man that formerly drove horses is now employed to drive the trucks. There is a vast difference between the part played by the horse driver and the part played by the truck driver in the delivery system, although it is difficult to bring the average owner to a realization of this fact. With horses there were of necessity long waits; the horses required these, and the driver easily fell into the habit. With a commercial car these waits are no longer necessary, and in reality are a menace to the success of commercial car delivery.

The difference between successful and unsuccessful delivery by motor driven vehicles is usually associated in the mind of the owner with the cost of delivery. This is true in spite of the well known fact that many a motor truck installation is entirely successful and would not be dispensed with under any circumstances, in which the actual cost of delivering may perhaps be slightly higher than it was with horses. This is true of cars on account of the tremendous expansion of the business due to the use of trucks, increased radius of daily delivery, better satisfied customers, ability to connect for shipments, etc.

But usually the cost of delivery is the thing uppermost in the mind of the user, and this being the case, the effect of different types of drivers on the cost of delivery assumes an importance it did not have in horse delivery service. It did not matter materially just how well a driver controlled his horse; the difference between a good and an ordinary driver did not seriously affect the cost of delivery service. How different it is with motor driven vehicles. The difference between a good driver and an ordinary one very often has meant the difference between a profit in the delivery department and a loss, in other words, the driver has within his power the making or spoiling of the efficiency of the entire delivery service, as far as the cost of operation is concerned. A slight carelessness may mean an accident which in the case of a horse and wagon would mean but a few dollars, while with the truck it may mean hundreds of dollars. He may not oil the vehicle properly; with the wagon this is at most no great money damage, while, with the truck it may mean an entire new power plant, and that within a few hours after the parts have been neglected. Driving in the car tracks may perhaps strain the spokes of the wheels of the wagon, but it is not ruinous to expensive rubber tires, as is the case with the truck. So the comparison goes on ad infinitum, showing that the truck driver if he is an irresponsible, devil-may-care, sort of fellow, can in a very short time ruin any profit which might possibly result from the use of commercial cars.

This may be cited as a disadvantage of trucks, but with proper handling it is made an advantage. The average driver when he arises from the horse drawn vehicle to the position of chauffeur, with an expensive piece of machinery entrusted to his care, rises to the occasion. He becomes a better man, he wakes up and takes an interest in his vehicle, and in other ways almost immediately shows that he appreciates the responsibility vested in him. If he does not do this, the wise owner fires him at once, because it is within his power in a very short time to do untold damage.

Who Makes the Best Driver?

By questioning many users the conclusion is forced upon the writer that the so-called trained chauffeur, especially the man who has at one time driven pleasure cars, is not the man to operate commercial cars. This man, as a rule, feels above the handling of tons of freight. They desire to drive, but nothing more, and even when persuaded to handle the loads they are out of their element, and do not know how to pack a load properly, economically and safely. It takes years of experience to learn the art of stowing the load so that it will ride. For such reasons, the ordinary chauffeur, as a rule, is not well fitted to operate trucks. He usually demands more money, and does less work.

The business man hesitates to put on drivers who do not understand his particular business. Each line of delivery has innumerable peculiarities of its own; each class of goods requires a different experience for its handling. Drivers who have been in the employ of a firm for years are usually anxious to learn to operate motor vehicles, and their years of experience and knowledge of the business is an asset which cannot be gained in a short time. Learning to operate the motor truck can be acquired in a very short time, as long as the driver does nothing but drive. Of course, if he is required to care for the mechanism, then different training is necessary.

Should the Driver be Required to Make Repairs?

This leads us to the much-mooted question of how much of the care of the trucks should be placed in the hands of the

Systematic inspection prevents dejection

driver. This, it seems to the writer, is a matter which is dependent largely upon the number of vehicles in service. For instance, if the installation consists of but one or two trucks it is very unusual to hire a highly trained man to do nothing but look after the condition of the machines, and make repairs and adjustments. It is usually found more economical to hire competent drivers at from $3 to $6 a week more than is usually paid to the ordinary driver. These men are then held responsible for the oiling, adjustments, inspecting the vehicles, and making minor repairs. If, however, the installation is a large one where there are five or more vehicles, then it is economy on the part of the owners to have the highly trained specialist in charge of the service, a man who is paid at the very lowest $100 per month, and from that up to $200 a month, according to the size of the delivery service. Under these conditions the driver does nothing but drive, and has the strictest instructions not to touch or tamper with any part of the mechanism. If he is stuck anywhere on the road, he is to call up the emergency department, who will immediately go to his relief, but under no circumstances is he to attempt to make adjustments or repairs. In this way the machines are thoroughly inspected at either timed intervals, or intervals which represent definite mileage, and the trucks are kept in first class condition, and always ready for efficient service.

The conclusion may then be drawn that only where it is impossible from a financial point of view to have a specially trained man look after the vehicles, should the drivers themselves make repairs and adjustments. Just as soon as the installation becomes large enough to warrant the special man, it is economy to pay less to the drivers, and put the difference into the salary of the delivery or garage superintendent, as he is usually called.

The Bonus System

There is no doubt but that the bonus system pays. The actual amount of money offered is usually insignificant, as compared to the actual savings due to the correct care of the trucks. The cash rewards which are made near the holiday season, are greatly appreciated by the men; if a series of credits or demerits are given, based on freedom from accidents, promptness in the morning, appearance of vehicles, attention to oiling and grease cups, or other duties which may be assigned. The relative standing of the drivers should be announced, posted, or handed to them, so that a friendly rivalry will ensue. If this feeling is not aroused, the system is not working satisfactorily.

The progressive or sliding scale of wages has sometimes been employed to great advantage, especially where there are many vehicles in use. Here the drivers start on, let us say $12 a week, and remain at this wage for a period of three or four months. During this time various inspections and records are made of their work. If these records come within specified limits, the driver is then placed on a $14 a week schedule, and remains upon this salary for another period. If at the end of this time his record and that of his vehicle come within the prescribed limit, he is again raised to $16 a week, and this may continue to whatever the company determines as the maximum which they can afford to pay for the work. It is astonishing the rivalry which will be developed and the pride which will be shown by those who are able to remain on the high schedule, and the amount of dollars and cents is largely in excess of the additional amount paid as wages to the drivers. There are numerous variations of the bonus system, the details of which can be worked out for individual cases. These are merely spoken of in the way of suggestion.

The wise owner will, therefore, instruct his horse drivers, and fit them for operating motor trucks. He will endeavor to make the men realize the advantages of operating the truck, and that he is more important than before to his firm. The wise owner will not permit drivers to make adjustments or repairs, except in the smallest installations where it is not possible to put on special men for this work, and above all, he will endeavor to stimulate among his men that feeling of friendly rivalry and pride in their vehicles which results in economical and efficient motor truck operation.

DUNLOP WIRE WHEELS TO BE BUILT IN AMERICA

The Dunlop Rubber Company, Ltd., London, England, with several influential New York business men has recently organized the Dunlop Wire Wheel Corporation, 2130 Broadway, New York City, to manufacture the well known Dunlop Detachable Wire Wheel in America. The Dunlop Rubber Company with the above corporation owns the United States patents rights and a license to make these wheels in this country under the Rudge-Withworth patents and also owns the United States patents on a special locking device used. The English Company is interested financially in the new company and this combination will insure co-operation. The personnel of the company is composed of automobile and business men well known in the trade and has strong and influential financial backing.

GUNN RESIGNS AS STUDEBAKER MANAGER

In order to meet the demands made upon his time and services by other clients, James Newton Gunn, general manager of the Studebaker Corporation, of South Bend, Ind., and Detroit, Mich., has tendered his resignation to the Executive Committee of that corporation. The resignation took effect on July 15.

Mr. Gunn remains upon the Board of Directors of Studebaker and his laying down the position of general manager will cause no change to be made in the administrative policy of the corporation.

Clarence Booth, of Detroit, who has been assistant general manager under Mr. Gunn's administration, has been appointed general manager of the automobile division.

NEW TRUCK COMPANY FOR TOLEDO

The National Motor Truck & Manufacturing Company, Gibsenburg, O., has been organized with a capital of $25,000. It has secured the patterns, patents and good will of the Toledo Truck Company, Toledo, O., and expects to have the plant in operation by December 1.

He's not the best carpenter that makes the most chips, nor is he the best chauffeur that makes the most trips

Florists Now Using Commercial Cars in Delivery Service

Artificially Heated Bodies, Pneumatic Tires and Special Spring Equipment Protect the Delicate Loads

THE use of commercial cars for the delivery of cut flowers, set pieces and floral decorations in general, is not as common as it should be for the advantages it offers of quickly delivering such perishable goods that florists using motor driven delivery wagons consider them also as a decided asset as far as the advertising value of the vehicles is concerned. In a recent trip to New York the writer found comparatively few of the numerous New York florists employing motor delivery. These few, however, tell but one story, that motor driven vehicles are a decided advantage in this particular class of trade. Promptness of delivery is probably nowhere more pleasing to the customer than in connection with the purchase of flowers and floral decorations. These are almost without exception connected with social functions, weddings, funerals and other events, which are not as a rule to be postponed. When he sends flowers to his lady, he is usually very anxious that they arrive at the opportune time. Then again, the nature of the goods is such that protracted delays in transit are often damaging in the extreme, and may be fatal to future trade.

Among the large florists, however, two vehicles is about the extent of the equipment, most of the dealers having but one small 1500-lb. wagon. This usually takes the place of two and sometimes three horse wagons.

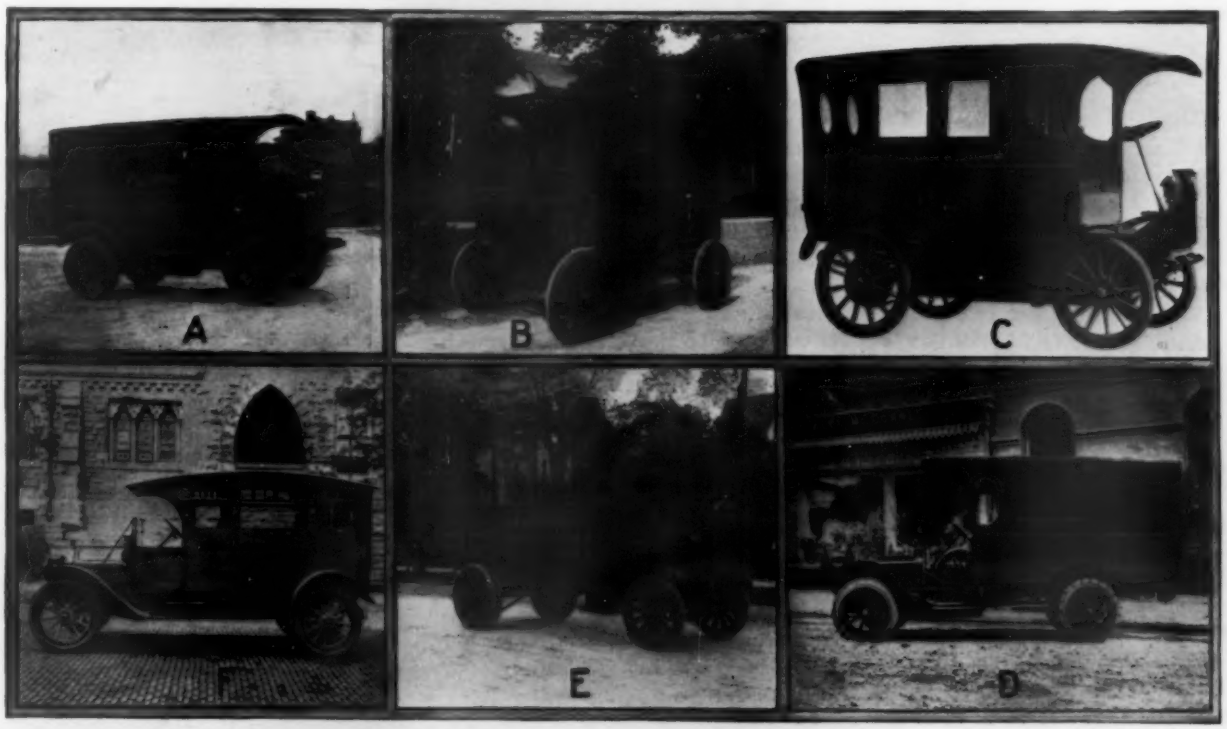
There is also as mentioned the advertising feature in connection with the use of trucks by florists, namely, that of the "swell" appearance of the turnout. An up-to-date delivery service with driver and boy in neat livery with a vehicle of good lines and business-like appearance is an asset in getting trade which cannot be lightly overlooked.

Special Bodies

The florist's vehicle is usually provided with a closed panel body. Some of these are highly ornate, having decorated carved side panels, with beveled glass windows or mirrors. Doors are usually provided at the rear and a curtain at the front, occasionally also doors at this point back of the front seat.

Easy-Riding Qualities

In order not to jolt unnecessarily the delicate contents, nearly all of the florists' wagons are operated on pneumatic tires of comparatively large size, and this is not only an economy in the point of saving the flowers, but also on account of its protection to the entire mechanism. As a rule very flexible springs are used, these often being actual touring car springs.



Vehicles Used by Florists and Floral Supply Houses

A. Autocar truck of H. H. Battles, of Philadelphia, which covers not only the city, but even points as far distant as sixty miles. B. G.V. electric truck, used by the Highland Park Greenhouses, New York. C. Detroit Electric, with special body, as used by John Breitmeyer's Sons, speed, fifteen miles per hour, fifty miles on a charge; capacity, one thousand pounds. D. White truck, used by Alex. McConnell, of New York. E. The Sternberg truck of W. W. Barnard Company, Chicago, used in hauling florists' supplies. This vehicle is of two tons capacity. F. Novel body on a Dorris chassis of fifteen hundred pounds. This car has supplanted three single horse-drawn wagons.

There is perhaps a reason why more New York flower companies are not using trucks owing to the comparatively short range of delivery covered by these stores. Many of them are extremely local as far as the trade catered to is concerned, the city being such that within a radius of a very few blocks there is a population as large, if not larger, than that of many small towns which support more than one florist.

Warendorff Wagons

In speaking of the New York florists, one of the most prominent is Warendorff, there being five stores operated by the Warendorff Brothers. Two of these stores, namely, the one at 1193 Broadway, and the one under the Ansonia Hotel on Upper Broadway, are using trucks. That in use at the store at 1193 Broadway is a Chalmers, which has now been in service for two years. The car, as usual, is operated on pneumatic tires, Mr. Warendorff believing thoroughly in the use of pneumatics on lightweight trucks as an effective way of reducing repair bills. The body is of the closed panel type fitted with removable shelves and hooks. It is not heated, although used in the winter, as all goods at this season are well packed and wrapped in cotton, and the natural warmth is sufficient to heat the flowers.

This truck replaces two wagons, but is also used in out-of-town service, going as far as Asbury Park and points in Connecticut. The usual day's work is done between 9 A. M. and 6 P. M., and as a rule, it does not average over 50 to 55 miles. The body is as light in weight as that of a touring car.

When asked as to the advantages of using commercial cars, Mr. Warendorff said that he figures the expense of the cars was greater than horses, but that it paid to have them. No trouble was experienced with the car during last year, it being out of service but three different times for minor repairs and changes. The appearance of the machine is an important item, and at the time of this writing, it being the slack season in summer, it was being overhauled and painted, which has to be done every other summer in order to keep the car in condition.

The Warendorff store at the Ansonia Hotel, Broadway and Eighty-first Street, uses a Schacht, which has just been put in service. This is a 1500-lb. car fitted with panel body finished in black as shown in an accompanying illustration. The interior is heated in this instance by small oil stoves or lamps provided for this purpose. These are held in a bracket, and supplies all the heat that is necessary. Shelves are arranged crosswise in the body and are removable. The usual curtain at the front, back of the driver's seat, has been replaced in this car by special sliding doors with windows, as shown in the accompanying photograph. These can be slid to one side, and the back of the front seat laid flat so that any long floral piece can protrude through the front and thus be carried without damage. This car is fitted with large pneumatic tires 34 by 4 in., and is mounted on special touring car springs. The axles and running gear, however, are especially heavy. The body measures 80 in. long, 66 in. high, and 49 in. wide.

Some Philadelphia Florists Who Find Motor-Driven Vehicles Helpful

Conditions in Philadelphia are even more advantageous for the use of commercial cars by the florists than in New York. This difference is due largely in the grouping of the population. In New York the population is very much more congested. Small florists have within a very small radius a population of two or three thousand inhabitants as customers; in fact, they do not cater to any but local trade. In Philadelphia the population is very much more scattered, and the florists, as a rule, supply a much larger territory. The city is spread out and deliveries to distant points in the suburbs are quite a rule. One of the well known florists in Philadelphia using trucks is H. H. Battles, 108 South Twelfth Street. This old established house is now selling to debutantes and for weddings, funerals, etc., of the grandchildren of those who were customers in years gone by. This company is now using two Autocars, having used motor delivery for the past three years. When asked why they discarded the horse for the motor the answer came promptly, "Because we intend to keep ahead of the times, we intend to be up-to-date, and if there are any advanced or improved methods which will make it easier for our employes, or improve the service to our clientele, we intend to use them."

H. H. Battles believes in the best. When horses were used the animals and the wagons were a credit and the pride of the company, and in the same way the trucks are fitted with handsome panel bodies, with considerable brass trimming, but not gaudy, and are handsomely painted and decorated. None but expert drivers are employed. When interrogated on the subject of drivers, and as to using the old help, Mr. Battles remarked, "Life is too short to educate porters to become chauffeurs." He believes that it is false economy to try to turn a truckman into a chauffeur.

The cars were bought by this company at the first, the Autocar rental service not being used. In connection with garaging, he also stated that again it was a false economy to try and take care of a small car equipment, expecting the driver to work all day and repair trucks all night, and care for his work properly in the day time. He believes in garaging the trucks outside where they have every facility for caring for them properly, and letting the drivers do nothing but drive, although competent men are employed who can make minor adjustments or repairs on the road whenever this is necessary. Recording instruments have not been found necessary as the drivers are not only capable, but responsible men.

As is the custom with most florists, the cars are overhauled, painted and varnished during the comparatively slack season of the summer. During the fall, winter and spring months they are kept continuously at work, and during rush seasons extra wagons are sometimes hired.

These trucks go anywhere in Philadelphia, or to neighboring cities. Trips have been made to Wilmington, Bethlehem, Trenton, N. J., and even to Reading, Pa., the latter city being sixty miles by railroad.

Trucks Carry Flowers Better Than Train

Of course, horses are out of the question for any such service as this, the trucks taking the place of the railroad, shipments of flowers formerly being made by express. In regard to this matter, Mr. Battles stated that the trucks were very much more satisfactory than the express for several reasons. Railroads were not always equipped for handling delicate floral pieces and some were damaged in shipment. The railroad employees are, as a rule, not used to handling flowers. With trucks their own men do all of the handling,

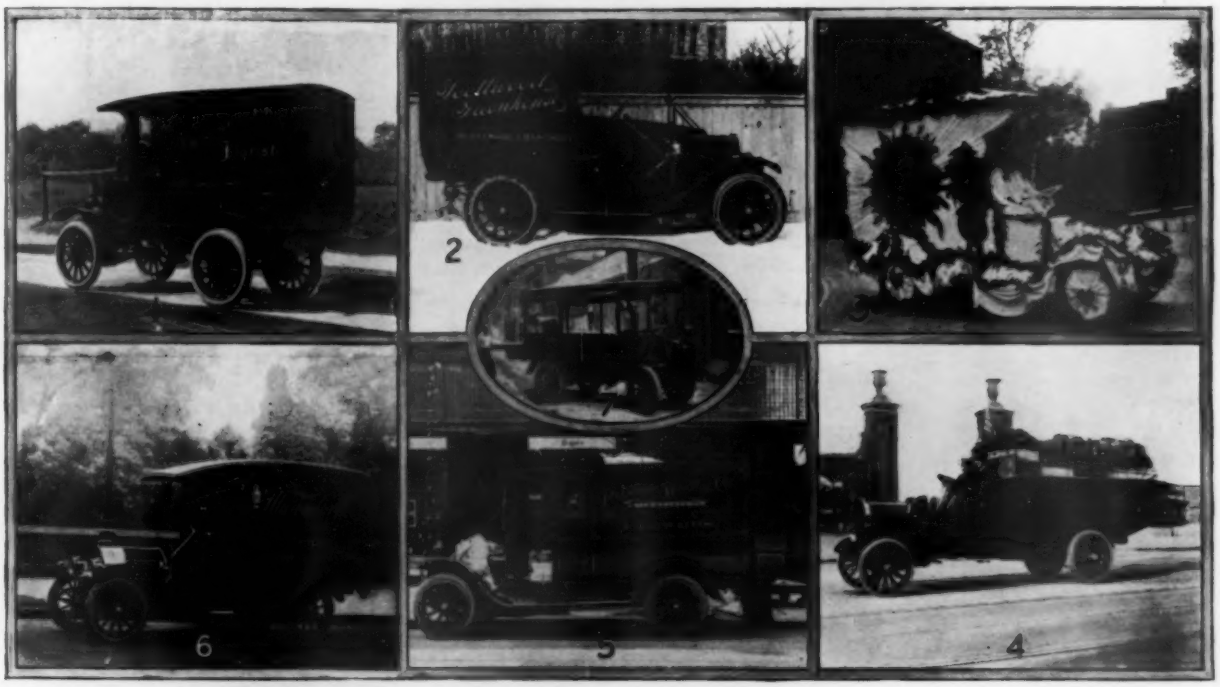
the goods never being out of their control. They are not handled as many times and are packed carefully but once, and unpacked at their destination.

The truck bodies are fitted with removable shelves, thermometers and electric lights operated from the storage batteries. Lehman heating bricks are used in the winter to keep the interior at the proper temperature. The vehicles are all fitted with pneumatic tires. On the whole the trucks have proven eminently satisfactory, and this company has no thought of ever going back to horses again.

employed, and again their chief advantage is their quicker delivery.

Pennock Meehan, No. 1608-16 Ludlow Street, Philadelphia, Pa.

employs an Autocar fitted with an open express body with top and side curtains. This car is now operated on pneumatic tires, but solids were formerly employed. These were not found satisfactory, not alone from the fact that they jarred the flowers, but it is their opinion that the repairs to



Typical Bodies as Used by Florists

1. Mora car used by J. M. Strejcek, which has proven very valuable during rushed season, and operates for less than horses. 2. A Willys-Overland used by the Scottwood Greenhouses of Toledo, Ohio The exhaust is run up through the body to keep it warm during the winter. 3. A Lippard-Stewart, used by Gude Brothers, of Washington, D. C., decorated for a Washington parade. 4. A two-ton GMC used by A. F. Coolidge, a New England florist, in carrying plants and flowers from country greenhouses to the city stores. 5. A fifteen hundred pound White truck, being loaded in front of Pelicano-Rossi & Company, of San Francisco, Cal. Attention is called to the large pneumatic tires. 6. One of Warendorff Brothers', New York City, trucks. It is a Schacht, and has some special body arrangements, as described in the text. 7. An Autocar truck of the Pennock Meehan Company, Philadelphia, being loaded at the store.

Small Delivery Car Sufficient for Cut-Flower Dealers

Charles Henry Fox, of 211 S. Broad Street, is another Philadelphia florist who is a truck user, a Packard touring chassis fitted with a suitable panel body having been employed for the past three years. The loads, however, are very light, and the chief advantage of the truck is its ability to quickly take care of emergency orders in suburban sections, or in distant parts of the city. Formerly these were cared for by the boys who carried the packages on the cars.

This company, owing to the fact that the packages carried are so very light and the truck never carries more than 100 lbs., has decided to use a Ford runabout fitted with a suitable body. This can undoubtedly be operated for less than a larger car, and will serve this purpose just as well. Mr. Fox will not go back to horses, but will continue to use a few boys, as there are occasionally hurried calls which must be attended to at once, and the boys apparently are the cheapest solution of the problem, so that the light truck and the boys will now care for the work.

Among the wholesale florists trucks are more commonly employed. In this line the cars can be kept more uniformly

the truck were greater when operating on solid tires, and that in the long run, pneumatic tires pay, especially as the truck operates at a fairly good speed.

A closed panel body was also used, but as the goods in this wholesale line are more or less bulky and boxed, it was found that it was difficult to load, and the body was not as satisfactory as an open one. The truck is often loaded to capacity. It replaces from two to three wagons and when kept busy is much less expensive than horses. However, in this case the item of expense is not the chief consideration, the increased range and quicker service being more important considerations. With horses, orders often had to be refused which were wanted in a hurry, deliveries to be made at distant points in hot weather, and it was impossible to send the horses.

This company employs as driver, a man who was formerly with them, and who is familiar with their routes and business. He has proved to be a careful operator and has given satisfaction. The truck is cared for by the Autocar Service Department, there being a regular set maintenance charge by this company.

Leo Neissen Company Using Trucks

This well known wholesale florist at 12th & Race Streets, Philadelphia, first employed a Franklin truck, which was purchased about two years ago. The first experience was not altogether satisfactory, largely owing to a driver who was not only incompetent, but had the speed mania, this man being arrested three times before the company dismissed him. Shortly afterward an Autocar was purchased and the Franklin sold, and another Autocar put in service, these two cars now handling all deliveries. They were bought outright, the Autocar service not being employed with this one exception, during the slack season, which occurs in July and August, the trucks are carefully overhauled at the Autocar Service Department, but the work is done by the Neissen Company's drivers under the supervision of a service foreman. The service department carefully goes over the machines and gives a written statement as to their condition, and just what repairs or adjustments are necessary. This work is then done by the driver, and if he encounters repairs which he cannot make, help is supplied by the Autocar Company, it being charged for at a special pre-arranged rate. In this way the drivers take an unusual interest in their cars, and are anxious to have them stand up while on the road, as breakdowns reflect upon their ability in repairing. The drivers are not laid off during the slack period, but are kept employed as above mentioned. Beginning with September and on until July the cars are kept very busy, and extra deliveries are sometimes necessary. One of these drivers is a good mechanic and is paid $15 a week, while the other receives but $12, the $15 man looking after and having supervision over both vehicles.

Boys Not Dependable

The company formerly used two one-horse wagons, two drivers, and from eight to ten boys, but of course the amount of business that was carried on was not then as great as it is at the present time. The boys, however, were not dependable. Important deliveries were often delayed and occasionally they did not show up for work at all. With the cars only two or three boys are necessary and there is considerable saving in both time and expense. These boys are used to deliver specials in the center of the city, and an occasional delivery to a distant point, where it would not pay to send the truck for so small an order.

The trucks are garaged by the Leo Neissen Company at a public garage. The cars average about 65 miles a day, covering the entire city of Philadelphia, Germantown and surrounding territory within a radius of twenty-five to thirty miles.

Mr. Niessen stated that the trucks were all fitted with pneumatic tires, but blowouts and tire troubles were quite common and often delayed deliveries. For this reason Dahl inner cushions were used. At the time of this writing a new tire so equipped was being placed on one of the trucks, and he remarked that that tire would probably never have to be taken off or touched until it was worn out.

In the group picture we have illustrated a car of Gude Brothers, Washington, D. C., florists, as decorated for a recent parade in Washington, the decorative scheme being by their floral designer. It won the first prize of $150 as being the most attractive car in the parade and was said to be one of the most elaborately decorated cars ever appearing in Washington

J. M. Strejcek, a florist of Cleveland, is using a Mora truck for his delivery work. He says that while he has kept no accurate record of what the wagons cost him, he is sure that it is less than that of a horse and wagon, and considering the work it has done in the year he has been running it, he would not for a minute consider going back to horse drawn vehicles. It has not only enabled him to take care of rush orders, but he has been able to enlarge his territory, and is now doing business in districts he never thought of going into when he had the horse wagons alone.

John Walker, Youngstown, O., is also another satisfied user of the Mora gas car for delivering his flowers.

Detroit Florists Using Electrics

Although most of the florists are using gasoline machines, a few are using electrics for their city deliveries. Among these may be mentioned John Breitmeyer's Sons, of Detroit, Mich. This company uses an Anderson electric which is herewith illustrated, and are very much pleased with the results obtained. They have had no trouble and have obtained as high as sixty-four miles a day on a single charge. This company believes there are many advantages in an electric delivery service for city work, and the statement was made by Philip Breitmeyer that he thought that in a short time most of their deliveries would be made by electric cars. This particular car was installed to take care of special plant delivery service, and is covering a territory they were not able to handle satisfactorily with horses. All horses have been done away with. The truck averages from forty-five to fifty miles a day. The sides of the body are glass and show off the bouquets and flat set pieces while in transit.

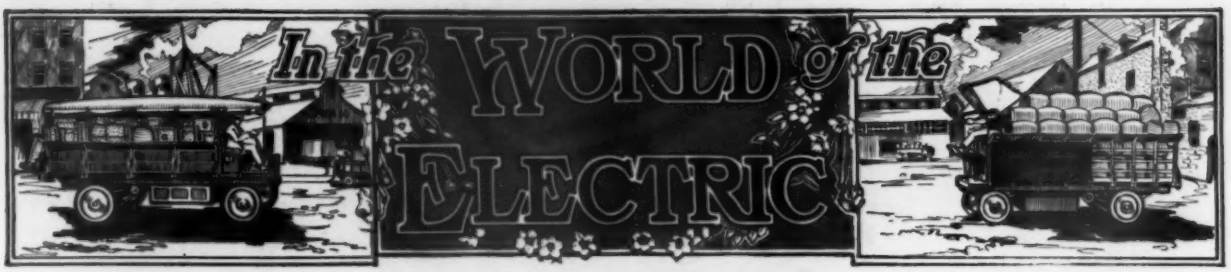
Special Body Arrangement

Showing sliding doors in front to allow long floral pieces to protrude. Used by Warendorf, N. Y.

The car is kept in the company's own garage, and cared for entirely by the driver, who is one of their old delivery boys well acquainted with the business.

Another company using electrics is the Parke-Davis Company, of Detroit. Three Detroit electrics are used for special orders, and handling express shipments. Formerly this business was handled by horses, but as there has been a large increase in the business it is impossible to make any comparison with the horse methods formerly used. Cars have been added from time to time as the service demanded.

This company figured the use of cars from a cost per mile basis, and then compared the result with delivery costs in the past, which showed a decided saving by the use of commercial cars, to say nothing of the quicker transportation.



A NEW SERVICE CAR

The electric service car here illustrated, is intended for such use as a patrol, arc light trimming, meter inspection, etc. As shown here it is used as a trouble wagon. It is built by the Bailey Electric Company, of Amesbury, Mass.

Its batteries are 60 A-6 Edison cells, which will give a speed of 20 m. p. h., and a mileage of sixty to eighty on one charge.

For carrying tools, etc., a box 32 x 23¼ in. and 16 in. high is placed back of the seat, and two boxes, 35 x 12 in. and 5¼ in. high on the running boards.

Equipment consists of top with side and front curtains, electric head and tail lamp and swivel searchlight; electric horn, ampere hour meter, irons for ladder, charging cable, full tool equipment, jack, tire pump, etc.. Tires are 33 x 4 in. pneumatics.

At a directors' meeting, held July 9th, the Baker Motor Vehicle Company, of Cleveland, advanced George H. Kelly, from the position of manager of the truck department to the office of secretary and sales director. R. C. Norton, heretofore secretary and treasurer, will continue as treasurer. E. J. Bartlett becomes sales manager of the truck department, and O. B. Henderson continues as sales manager of the pleasure car department.

EDISON CELLS TO THE RESCUE

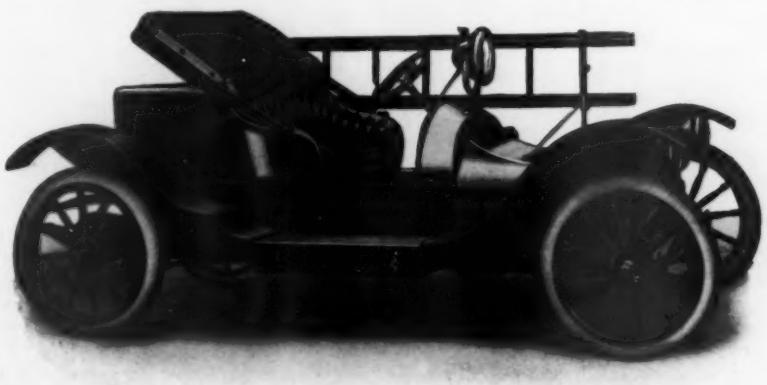
At Huntingdon, W. Va., the fire-alarm system is operated by central station current. When the powerhouse was put out of business by the flood it was up to the Company to get current on the fire-alarm circuits. Wm. R. Power, manager of the commercial department of the Consolidated Light, Heat and Power Company, told at the Convention how he ran an electric up to the fire "central" and connected enough Edison cells to the alarm system to give the proper voltage.

DETROIT ELECTRIC IN DELIVERY SERVICE

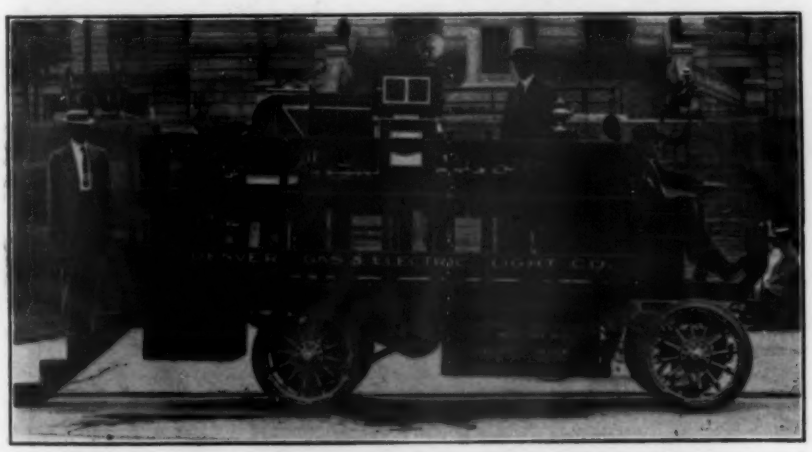
A. Lisner, proprietor of the Palais Royale store at Washington, D. C., is an enthusiastic advocate of the Detroit Electric Commercial Vehicles. He purchased his first two electrics in the early part of 1911 and later in the same year ordered two additional cars. In 1912, a Detroit Electric furniture van was secured and in the early season of 1913, five more Detroit Electrics were added.

The performance of these cars has been consistent in every respect, speedy deliveries being made at low cost, and due to the splendid appearance of these vehicles, good advertising value has been secured. All machines are equipped with Edison battery varying in size according to the vehicle. Solid tires are used throughout.

The carrying space of the 1000-lb. car is 73 in. long, 43 in. wide; of the one-ton car, carrying space is 80 in. long, and 48 in. wide. In the furniture van space is 13 ft. long, 6 ft. wide and 6 ft. 6 in. tall.



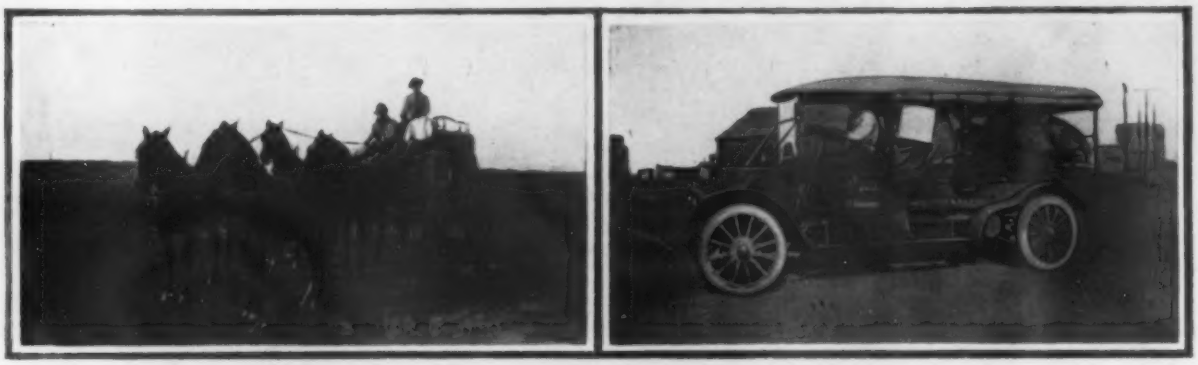
The Bailey Electric Service Car



Electric Truck Used for House-to-House Canvass

A two-ton Baker electric with specially designed body is employed by the Denver Gas and Electric Light Company, of Denver, Col., for carrying all kinds of current-consuming devices. As shown in the illustration, this truck, loaded with stoves, cookers, fans, cleaners and all varieties of electric appliances, makes a house-to-house canvass to demonstrate each article. A close examination of the picture will show wires which connect the different pieces of apparatus with the batteries of the truck, thus affording current for operation.

Joseph E. Baker has resigned his position as Springfield (Mass.), representative for the General Vehicle Company, of Long Island, N. Y., and has accepted the position of electric vehicle manager for the Spokane Water Power Company, Spokane, Wash. In accepting this position, Mr. Baker does not give up entirely his connections with the General Vehicle Company, as the Spokane Water Power Company controls in that section the output of the General Vehicle Company.

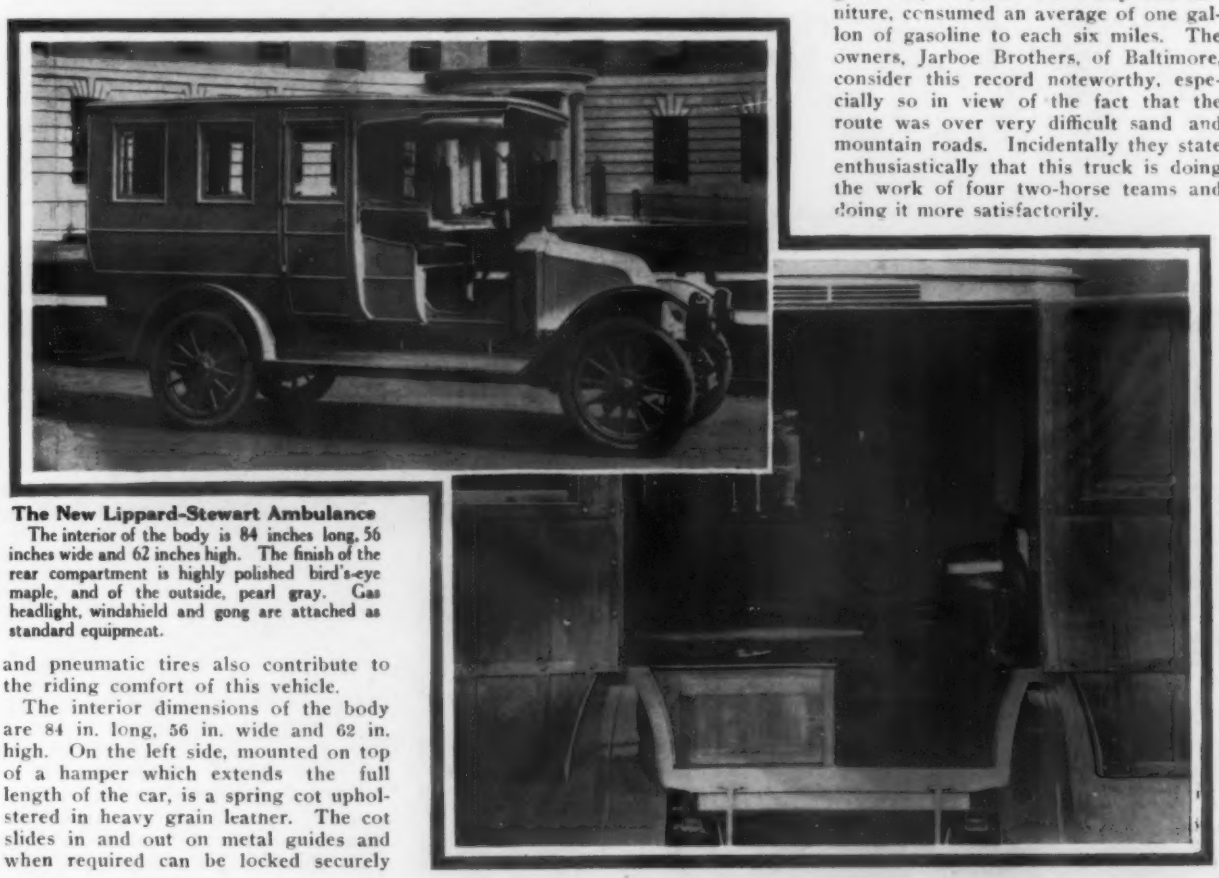


The Old and the New

A Federal stage was sold to the Wamsutter-Slater Stage and Expressing Company, of Wyoming. It is being used to cover a route hitherto traveled by stage coach and it passes through one of the most desolate sections of this country. The distance between Baggs and Wamsutter, the route on which part of the service of this truck is used, is fifty miles. Formerly it required two changes of horses each day, or twenty-four horses for the round trip. The company also held eight horses in reserve for emergency use, so that the lone Federal has replaced thirty-two horses. The truck carries about twenty-seven hundred pounds on its daily trips.

LIPPARD-STEWART AMBULANCE A COMPLETE EMERGENCY CAR

The ambulance which is a part of the line of commercial vehicles manufactured by the Lippard-Stewart Motor Car Company, of Buffalo, N. Y., shows in its design the latest ideas for a vehicle of this type. The car makes use of a chassis with a wheel base of 125 in., which gives ample provision for a roomy body construction and extremely easy riding qualities. Long flexible spring in place by a clamping device operated by a T-handle on the rear. Two collapsible revolving seats are provided for the use of nurse and physician within whose easy reach is placed a wash bowl, which is supplied with running water from a tank mounted on the side of the car. Medicine chest, speaking tube and electric dome lights also add to the convenience which this car's equipment affords. A stretcher of customary construction completes the emergency apparatus.



The New Lippard-Stewart Ambulance

The interior of the body is 84 inches long, 56 inches wide and 62 inches high. The finish of the rear compartment is highly polished bird's-eye maple, and of the outside, pearl gray. Gas headlight, windshield and gong are attached as standard equipment.

and pneumatic tires also contribute to the riding comfort of this vehicle.

The interior dimensions of the body are 84 in. long, 56 in. wide and 62 in. high. On the left side, mounted on top of a hamper which extends the full length of the car, is a spring cot upholstered in heavy grain leatner. The cot slides in and out on metal guides and when required can be locked securely

RAILROAD HAS TRUCK COMPETITION

The Diamond-Keystone Supply & Transportation Company, of Philadelphia, Pa., has been organized to engage in transporting produce from farms in the vicinity to the Philadelphia markets. The new company expects to use a dozen or more trucks.

The Kissel Kar two-ton truck, which recently made a remarkable 150-mile round trip between Baltimore and Hagerstown, Md., loaded one way with furniture, consumed an average of one gallon of gasoline to each six miles. The owners, Jarboe Brothers, of Baltimore, consider this record noteworthy, especially so in view of the fact that the route was over very difficult sand and mountain roads. Incidentally they state enthusiastically that this truck is doing the work of four two-horse teams and doing it more satisfactorily.

Mining Companies Use Commercial Cars

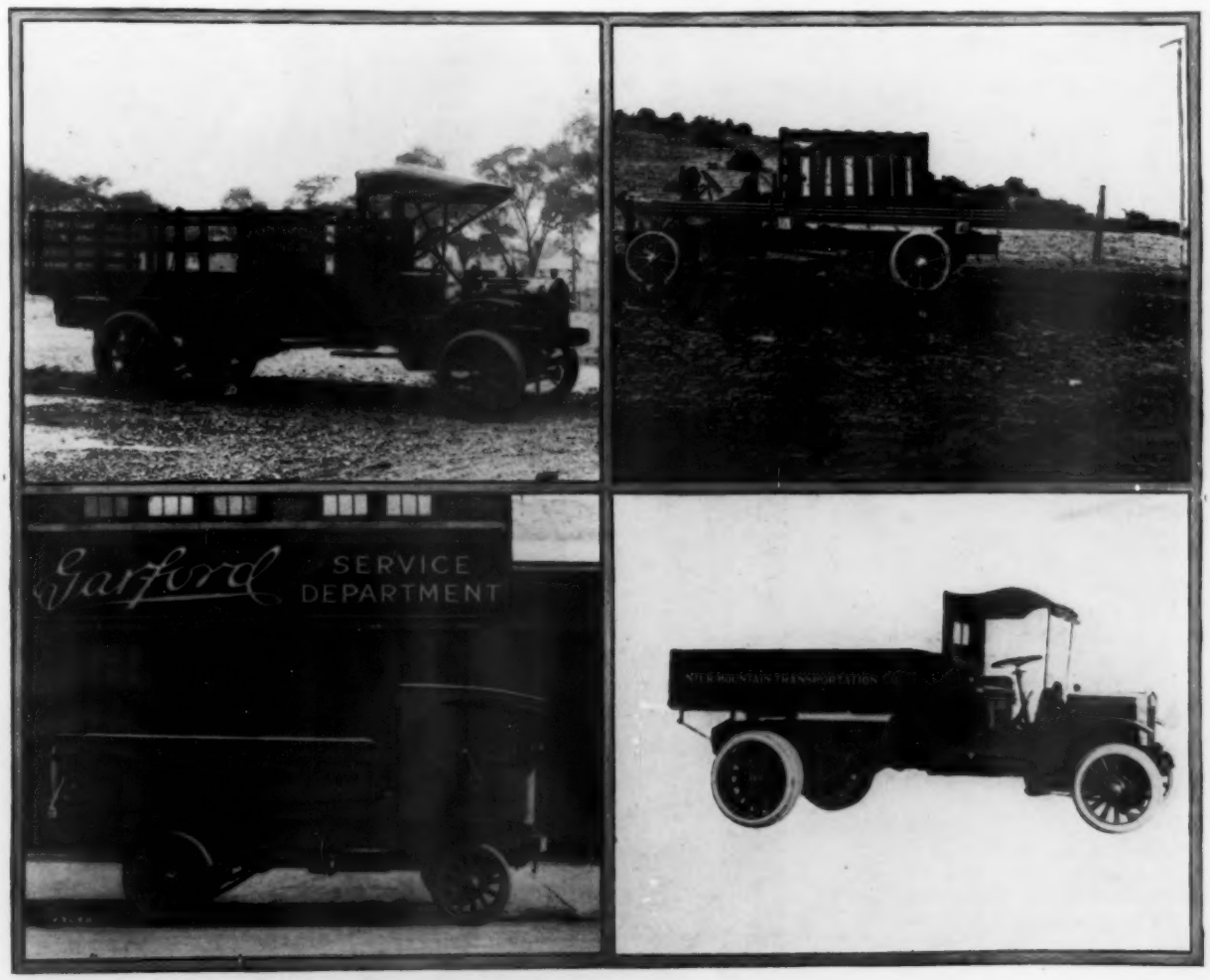
Motor-Driven Ore Trucks Making Their Way Into Distant Corners of the Earth. Ore Hauling Costs Reduced

One hardly expects to meet while in the middle of the sandy deserts of the West and Southwest, modern commercial vehicles, with just as up-to-date equipment as would be met on Broadway, New York, yet the traveler frequently meets these vehicles in the service of mining companies.

The trucks are used to carry ore between the mines and smelters, between the mines and shipping points, and between the coal mines and smelters. The distances are usually considerable, and the grades "horse-killing." The installation of a single truck often displaces six to eight horses, as these have to be used in relays and cannot cover the hot, dusty plains or mountainous roads except for short periods of time, and must then be given a long rest.

Examples of Such Service

The Santa Fe Gold and Copper Mining Company is using a La France hydraulic transmission truck in service between the smelter and the coal mines, a distance of approximately sixteen miles. They make the trip to the coal mine empty, and return with six tons of coal in approximately five hours. On the return trip with the six-ton load, a grade of over 8 per cent., fully three-quarters of a mile long has to be negotiated. The owners say, "The truck takes this grade very easily without steaming the water in the radiator. For the last five miles before we reach the smelter we have a continuous upgrade, and in two or three places the grade is over 20 per



Group of Typical Dumping Bodies Used in Mining Service

At the top is shown a couple of White trucks, the one at the right now being in service daily between Silver City and Mogollon, N. M. The character of the load is well shown, comprising parts of machinery and long pipes, as well as other miscellaneous articles. In the lower right, an Atterbury truck, used by the Intermountain Transportation Company. Five of these trucks have replaced twenty teams on the first half of the route on which they are used, and twenty-five teams on the remaining half. In the lower left is a Garford truck, used by the Mount Summit Ore Corporation in, hauling ore.

cent. for short pulls of possibly fifty feet. We have hauled as much as seven tons up these grades and have never yet been stuck." The statement was also made that the gasoline consumption varied between twelve and thirteen gallons for a round trip, and that the tires stood up extremely well.

Truck Hauls Thirteen-Ton Tractor Up Six Per Cent Grade

On one occasion the pulling power of this hydraulic transmission truck was thoroughly tested. The company's Rumely Oil Pull Tractor, which weighs between thirteen and fourteen tons, when eight miles below the plant met with an

La France Truck Demonstrating Pulling Power

accident and had to be towed up for repairs. The truck was loaded with about three tons, and it was hitched to the tractor and pulled it up within a mile of the plant on a continual up-grade, pulling the whole load in at least three different places over a grade of more than 6 per cent. The company points to the simplicity of operation as one of the strongest features of the truck, and the fact that it can be stopped and started on the heaviest grades without difficulty.

The Tecolete Copper Company, of Arizona, is now making use of a three-ton, and a five-ton Atterbury truck in hauling ore. The last of these makes the third which has been ordered by this company during the past two years.

Five Trucks Displace Thirty-two Horses

The Intermountain Transportation Company, of Salt Lake City, is also an Atterbury user, having now five Atterbury trucks in service; three of three tons capacity, and two five-ton trucks. Each of the three-ton trucks are replacing two double teams. The five-ton trucks are used with trailers, and each with its trailer displaces five double teams, making thirty-two horses in all displaced by five vehicles. They are used in hauling ore to and from the mines to the smelters, as there are no railroads as yet in the section. They have to negotiate the roughest kind of country roads and miles of sand from 3 to 6 in. in depth. To meet these conditions the cars are equipped with 42 by 6 in. twin tires. On one route the five trucks displace twenty teams on the first half of the route, or forty horses; and twenty-five teams or fifty horses on the remaining half, as the teams have to be changed every ten or twenty miles, according to the roads. Results are what count, and the trucks produce results, as the cost of hauling the ore which was $18 per ton, has now been reduced to $8 per ton with the trucks.

(NOTE.—For additional information on subject of Commercial Cars being used in the mining business, see page 43.)

Trouble postponed always has to be met with accrued interest,---systematically inspect your cars

MORELAND DISTILLATE AUTO TRUCKS USE MORELAND PATENTED GASIFIER

We wish to call our readers' attention to the article entitled "Moreland Truck Using Distillate Makes Record of One Thousand Miles at Fuel Cost of $7.21," which appeared in our July issue, on page 44. In this article it was stated that the creditable performance made by the Moreland truck was due to the use of the Barnard Gasifier. This, however, is a mistake, the gasifier which was actually used being the Moreland Patented Gasifier, designed by Watt Moreland, and which is used exclusively on Moreland Distillate Trucks.

The principle of this device is this; the distillate is vaporized by the application of heat, taken from an air jacket surrounding the exhaust manifold. The intake manifold is also fitted with an air jacket to supply the heat taken from the air in the mixing of the distillate and the air, thus preventing condensation and "loading up" of the motor. This double application of heat gives a clear dry gas, which burns clear. It is claimed that engines fitted with this gasifier do not carbonize as readily as the average gasoline motor.

Railroad Gang Drills

One of the railroad gang drills at the Detroit plant of the Continental Motor Manufacturing Company. Within the next few weeks the radial drill at the end will be replaced by a fourth multiple gang drill, speeding up the work considerably. This will permit drilling ninety-five holes per crank case in eighty-five cases each working day, or one every seven minutes as against one every eighteen minutes at present with the slower radial drill. The crank case can be placed in its jig in a minute and a half while an hydraulic crane raises and lowers the jig cover. The universal jig can be turned over by a simple movement and the crank case is drilled from both sides and ends.

Willet Three-Quarter and Two-Ton, Two-Cycle Commercial Cars

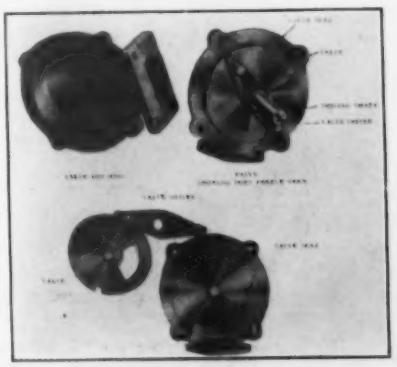
THE WILLET ENGINE & TRUCK COMPANY, INC., of Buffalo, N. Y., is now giving its entire time to the building of trucks, and is offering two distinct models—Model M—a 1500 lb. job (shaft driven), and Model L—a two tonner (chain driven). Both models are powered by the Willet two-cycle rotary valve engine which is the result of ten years' work in two-cycle engine building. The 1500 lb. molel is fitted with a three-cylinder motor, while the 2-ton machine has a four-cylinder motor. In other respects the power plants are practically identical.

Details of the Power Plant

The cylinder dimensions are 4½ x 5 in. The cylinders are made of semi-steel, cast en bloc. They are so designed that there are no sharp turns to the gases and they are entirely surrounded by a water jacket of ample size to insure perfect cooling. The heads are detachable, making possible the removal of the pistons and connecting rods without disturbing the cylinders.

The rotary valve which is shown in one of the accompanying illustrations, controls the supply of gas which is admitted to the crank case. In the crank case the gas is compressed and forced to the cylinder head through a by-pass as is common in two-cycle practice.

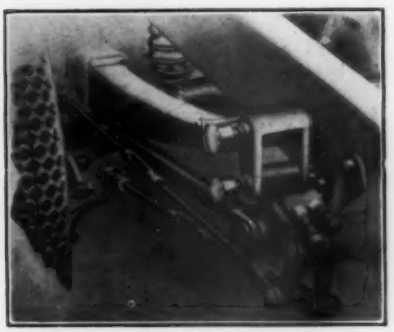
The rotary valve, however, is a patented feature. In working, it is so timed that the intake port is kept open during the entire upstroke of the piston, thus allowing a full and positive charge of gas to be drawn into the crank case regardless of speed. By having a large volume of gas in the crank case it is possible to obtain about a 5-lb. pressure, thus making a rapid transfer of gas to the combustion chamber.



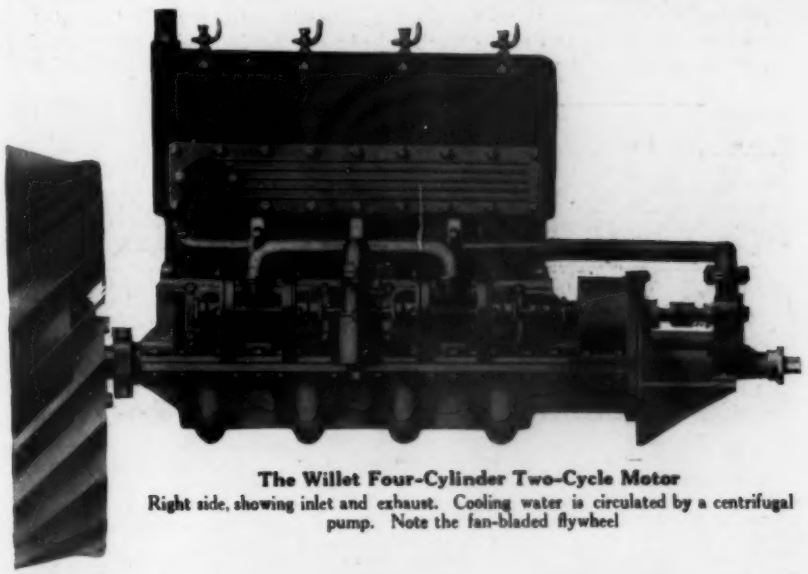
The Willet Rotary Intake Valve
The illustration shows the valve housing; valve seat, containing the part which connects to the carburetor; the valve driver and valve.

The valve is composed of the following parts as shown in illustration: the valve housing; the valve seat, containing the port which connects to the carburetor; the valve driver and valve. The valve is held against the seat by spring pressed plungers. The spring-pressed pins take up any play or wear which may occur in the valve, thus making it self-adjusting. The valve and valve seat are of cast iron; bearing surfaces ground, and all well oiled.

The water pump and magneto are driven by silent chain.



Radius Rod on 1500 lb. Model
It is placed between spring hanger and rear axle



The Willet Four-Cylinder Two-Cycle Motor
Right side, showing inlet and exhaust. Cooling water is circulated by a centrifugal pump. Note the fan-bladed flywheel

Lubrication is by mixing oil with the gasoline. One pint of oil is mixed with every five gallons of gasoline.

The pistons are fitted with three rings. The bearings are of bronze, lined with special light metal, and are interchangeable. The crank case is cast of nickel alloy aluminum, well ribbed. The crank shaft is a nickel steel drop-forging.

A Zenith carburetor, a French product, which has no moving parts or adjustment, is used.

Control and Drive

The Gemmer steering wheel is placed on the left with speed and brake control in the center. A single lever controls the gas, the spark acting automatically. The brakes are of the external contracting type, applied through equalizers on the rear wheels in Model

Willet Model M, Fifteen Hundred Pound Wagon
Showing standard screen body. Price $1850

M, and located on jack-shaft in Model L. Emergency brakes operate on the rear wheels.

The drive on Model M is by nickel steel shaft, with Spicer universal joints in oil-tight cases. Model L is shaft-driven from clutch to transmission with double roller chains from jack shaft to rear wheels.

The transmission is Brown-Lipe selective, three speeds forward and one reverse. The gears are 1 in. wide, nickel steel, equipped with Timken roller bearings. The clutch is of cone type, leather faced, with flat springs underneath and ball-bearing release. The roller bearings and axles are of the Timken type. The Timken rear axle allows easy access and removal of the differential and axles without taking the housings from the car, while the roller bearings are tapered and adjustable for wear.

Quietness and smooth running are qualities in Willet trucks which have been accomplished by means of the accurate fitting of parts, steel construction and the reduction of vibration—Model M having semi-elliptic and rebound springs, while Model L has an additional jack-spring. This prevents trouble from overloading.

One of the features of the Willet truck is found in the rear spring equipment. Instead of rigidly attaching one end of the spring to the frame the spring is not rigidly attached, thus, the strain is brought on the radius rod instead of on the spring. All small parts of the truck have been given careful attention. For instance all hub caps are bolted to the hub; brake rods are lined with Babbitt to facilitate repairing, and spring pins all hardened and ground. All wearing parts are adjustable, while any parts needing replacement can be replaced without replacing a group of parts. As an example the sprockets can be replaced without replacing the brake drum.

Dimensions of Models M and L

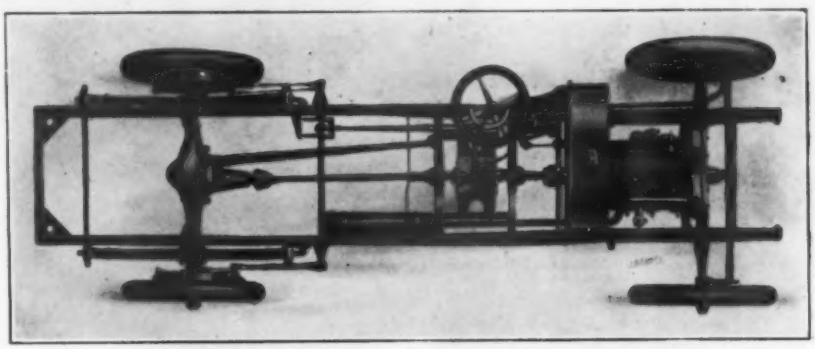
Model M wheel base is 125 in.; standard 56 in. tread. Road clearance 10 in. The Model L wheel base is 144 in. standard, while a special 168 in. wheel base is furnished if desired. The tread is 61 in. front, 65 in. rear. The standard body back of seat is 10 ft. 6 in. long, by 39 in. high; 6 ft. wide. Full length is 12 ft. by 39 in. Road clearance 11 in.

The standard finish is blue body, red running gears, and blue body with canary yellow running gears.

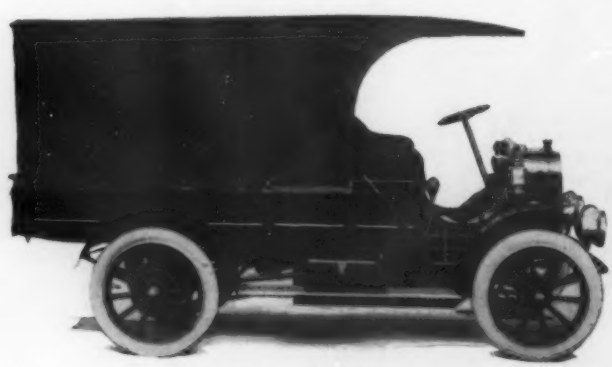
Tire dimensions on Model M are 34 x 4½ in. front and rear, pneumatic. On the 2000 lb. machine 36 x 4 in. solids are used in front and 36 x 3½ in. dual in rear, Kelly-Springfield make.

Prices

The prices are as follows: Model M, full panel body, $1800; special screen body $1850; chassis only, $1650. Model L. chassis only, $2800. Any kind of body can be furnished; all prices f. o. b. Buffalo.

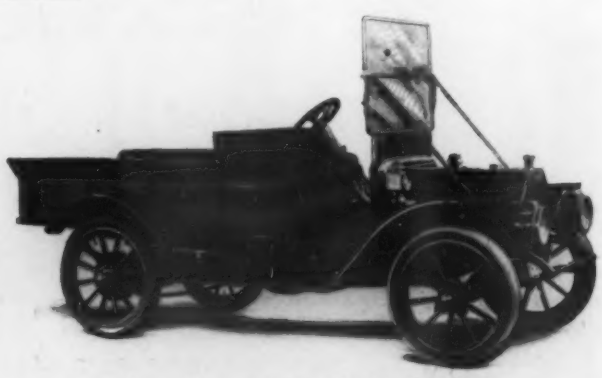


Top View of Chassis; Model M, Fifteen Hundred Pound
Illustration shows location of motor, radiator, controls, etc.



The Mason Model 12-13

This model, which retails at $1000, including both covered express and flare-board express bodies, is similar to model 12. The hood and dash vary slightly, but other mechanical details are identical. The front springs are semielliptic and the rear are full elliptic.



Mason Two-Cylinder Truck, Model 12

The Mason Motor Company, Waterloo, Iowa, manufactures this truck, which sells for $800. The two-cylinder horizontally opposed motor is located under the body and is cranked from the side. Planetary transmission is employed, with chain drive.

Wilcox Trux---Built in Three Models

THE Wilcox Trux are being built in three models, with one, two and three-ton capacities, by the H. E. Wilcox Motor Car Company, 1030 Marshall Street, Minneapolis, Minn. Chasses are finished in the lead. Trux are painted and lettered to order when bodies are furnished. The equipment includes driver's seat, horn, tools, hub odometer, three oil lamps, battery, and jack in each case.

The One-Ton Model

The motor is four-cylinder, 4¼ in. bore and 4½ in. stroke. A Mea magneto is used for ignition. Water cooling system is employed. Lubrication is by the coastant level splash system.

The clutch is of the cone type, faced with Thermoid. The transmission gives three speeds forward and one reverse. It is of the selective sliding gear type and is fitted with Timken roller bearings throughout.

The drive is through a jack shaft, and double side chains.

The front axle is Timken 1¾ in. I-beam section. The rear axle is Timken 2½ in. round section. Both axles are fitted with Timken roller bearings.

The brakes are a foot-operated service brake, of the internal expanding type, 2 in. wide and 11 in. diameter, operating on the jack shaft and a hand-operated emergency brake of the internal expanding type, 2½ in. wide and 17 in diameter operating on the rear wheels.

The steering wheel is on the right side with the control levers in the center. The steering gear is of the worm and toggle type.

Both springs are semi-elliptic; the front is 2½ in. x 40 in., the rear is 2¾ in. x 44 in.

The wheels are of the artillery type. The front tires are 36 in. x 3 in., the rear 36 in. x 3½ in.

The weight with standard open stake body is 3800 lbs. The wheelbase is 124 in., the tread is 56 in. An automatic governor controls the speed at 16 m. p. h.

The Two-Ton Model

The two-ton differs from the one in that a Bosch magneto is used, and the front axle is 2 in., and the rear is 2¾ in. The front springs are 2½ in. x 36 in., and the rear is of the platform type with side springs 2¾ in. x 42 in., and cross spring 2¾ in. x 38½ in. Also the tires are 36 in. x 3½ in. in front and 36 in. x 5 in. rear. The wheelbase is 117 in., the tread is 60 in., and the weight with standard open stake body is 5400 lbs.

The Three-Ton Model

The bore is 4½ in., the stroke 5 in. Bosch magneto is used. The front axle is 2¼ in., I-beam Timken. The rear is 3⅛ in. round section Timken. The foot brake is 2½ in. x 12 in., the hand brake is 3 in. x 17 in.

The front springs are full elliptic 2¾ in. x 36 in. The rear spring is of platform construction, the side springs are 3 in. x 44 in., the cross spring is 3 in. x 35½ in. The tires are 36 in. x 4 in. in front and 36 in. x 3½ in. in rear. The weight with standard open stake body is 6300 lbs., the wheelbase is 128 in. and the tread is 62 in. It is governed to 12 m. p. h. The chassis price is $3250. In other respects it is the same as the one-ton model.

Van Body on a Two-Ton Wilcox; Chassis Price, $2500

Wilcox One-Ton Truck Fitted With Screen-Side Express Body. Chassis Price, $2000

BARKER ONE-TON MOTOR WAGON

C. L. Barker, Norwalk, Conn., is placing on the market a new motor truck which has a quadruple unit plant—motor, clutch, transmission and steering gear. The motor is four-cylinder cast en bloc. The clutch is multiple disc with a four speed step-up transmission. The drive shaft is hollow and no radius rods are used. Tires are 42 in. x 5 in. A left side drive and center control is used.

The Alma Motor Truck Company, of Detroit, Mich., has established its general sales office for the sale of Republic trucks at 870 Woodward Ave., Detroit.

The F. Sturtevant Company, of Hyde Park, Mass., well known manufacturers of blowers and generator sets have purchased the plant of the Canadian Motors Company, of the same place, which will be established as a branch.

A Three-Wheeled Delivery Wagon

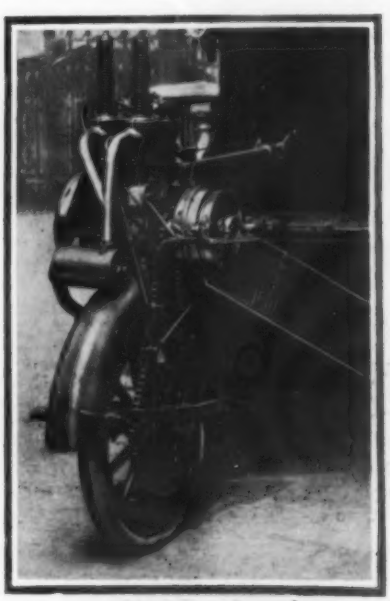
An acquisition to the rapidly growing three-wheeled fold is that of the Maxim Tricar, built by the Maxim Tricar Manufacturing Corporation, of New York City. This vehicle, which is designed for both business and pleasure, is the joint construction of Maxim Karminski, automobile engineer, who has had much experience in Europe, and Charles Peters, who also is an expert in the automobile field. The type of car is well known in Europe, but not as much so in America.

The motor is of the double cylinder vertical type, and develops about 8 h. p. The unit type power plant is suspended above the front wheel and the drive is through a single roller chain to a larger sprocket secured on the front wheel. This car appears to be a very simple affair, practically the entire machine being built over the front wheel, that is to say, the motor and transmission are thus placed.

It has been the practice of some followers of the three-wheeled design to place their single driving wheel in the rear, but the Maxim Tricar's and the driver is placed in front, a reversal of the common practice thus substituting the horse pulling the wagon.

The motor cylinders of this engine, cast singly, are placed side by side, and are secured to an aluminum crank case which is cast in two horizontal sections, having integral with it side plates which form the bed or support plates. The lower part of the crank case and transmission case are cast in one.

The motor is secured to a bed plate above and cast as a solid piece with the mud guard. This mud guard acts as the support for the motor, steering device and the shock absorber at the same time. The cylinders have integral ribs much as do the ordinary motorcycle, and some pleasure car types. Automatic inlet and exhaust valves of large diameter are used. The bore of the cylinders is 3¼ in. and the stroke 4½ in. The pistons, like the cylinders, are cast of gray iron, and the former have three compression rings placed above the wrist pin, while there is a fourth holding the pin. The crank shaft is 1¼ in. in diameter, and drop forged. The transmission is a simple two speed and reverse sliding affair, controlled from the operator's seat, and as but a slight movement of the wrist is necessary to engage either speed, to stop the car is a very easy matter. This transmission is carried on the left side of the motor case, being controlled from the steering rod or guide from which is a horizontal steel tube 1.5 in. in diameter.



Front View of the Maxim Tricar
Showing motor transmission, suspension, etc.

Side View of the Maxim Tricar Equipped With Light Delivery Body

The Drive

To eliminate road shocks the drive chain is fitted with a small sprocket idler fitted on the front hub, and this is provided with a spring attachment easily adjusted, so that as the car jounces over a rough piece of road, the tendency of the chain to jounce or wobble out of position is overcome. The axle of the front wheel is fitted on to springs, and the manufacturers claim the worst kind of road does not affect the smooth running of the car.

One of the most commendable features of the Maxim Tricar is that it is interchangeable. The motor, transmission and driving element being mounted over the front wheels, the entire propelling assembly is in one complete unit. The withdrawal of the locking or steering bolts connecting this unit with the chassis is all that is required to take out the damaged unit, and replace same with another one. The frame of the Maxim Tricar is made of channel steel of the so-called dropped type. The springs used are semi-elliptic in form, being built of five leaves 1½ in. wide, and 32 and 29 in. respectively. These springs are provided with a very simple shackle which allows plenty of play without disalignment. The wheels are wood, artillery type clincher rims being used, the tires being 28 x 3 in. in size. Ball bearings are used in the front and rear members. The hubs are made of steel and the spokes of the best grade hickory. There are two brakes on the rear wheel drums, the drums being steel 10 in. in diameter, with a 2½ in. face.

Ignition is by Bosch high tension system, the magneto being secured to the motor base and driven from the crank shaft. The motor is lubricated by splash. There are two types of bodies used for delivery purposes, one of the box type with a spare area of about 23 cu. ft.; the other is on the Ford commercial body type, covering the driver's seat. The load carrying capacity of this car is 600 lbs., excluding the driver.

The Ford Motor Company, Detroit, Mich., is using to its satisfaction Kelly Springfield trucks. The company says that one truck does the work of eight horses and uses one gallon of gasoline to each five miles travel.

General Motors Company, Detroit, Mich., has anticipated to the extent of $1,000,000, the $2,000,000 due on Oct. 1st, for the sinking fund on first lien 6 per cent. notes, by paying this amount in cash to the Central Trust as trustee.

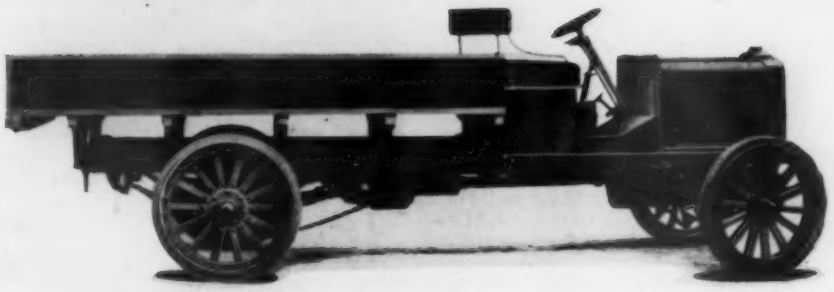
THE TROJAN TRUCK

The Toledo Carriage Woodwork Company, Toledo, O., is manufacturing the 1500 lb. capacity truck here illustrated.

A Unit Power Plant

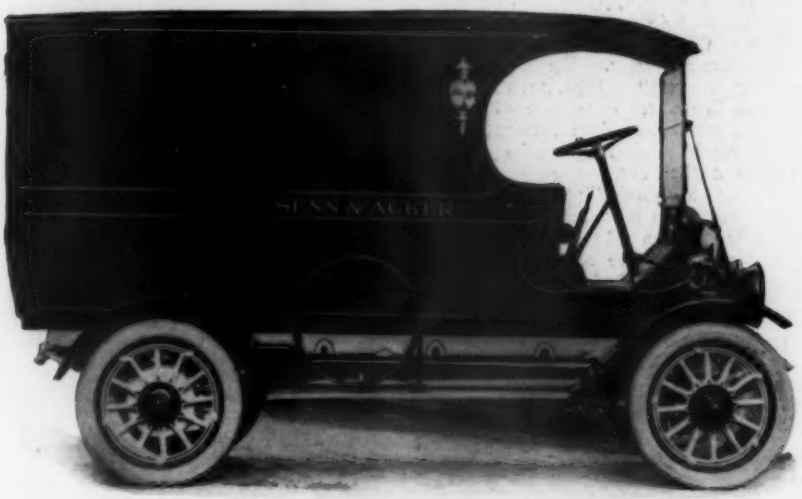
The motor, clutch and transmission are enclosed in an aluminum oil tight and dust-proof casing. The motor develops 28 h. p. and is of four cylinders, 4 in. bore and 4½ in. stroke, cast in pairs. Lubrication is a combination of force feed and gravity. A pump drives the oil to pockets over each crank shaft bearing. The oil flows on the connecting rods and overflows into the base, where it is screened and used again. Cooling is by centrifugal pump and honeycomb radiator. A Remy magneto and storage battery furnish ignition. Carburetion is by a Schebler carburetor.

The clutch is of the multiple disc type and is lubricated by a stream of oil when the motor runs. The transmission is of the selective type, giving three speeds forward and reverse, and is mounted on annular ball bearings. Gears are cut from drop forged steel.



The Corbitt Two and a Quarter Ton Truck

Motor, 4 cylinders, 30 H. P.; control levers in center; drive at the left; chassis price $2000



Trojan Fifteen Hundred Pound Truck

Right-side steer and center control. Motor under floor boards

The Drive Line, Frame, Wheels, etc.

A straight line shaft with universal joints is used to connect the transmission and differential. The rear axle is of the full floating type and is fitted with annular bearings. The front axle is I-beam section, 1½ in. x 2½ in. drop forged. The frame is pressed steel with a section offset between front wheels. The wheels are of the artillery type, 33 in. in diameter, with twelve 1¾ in. spokes. Tires are 33 in. x 4½ in. truck pneumatics, fitted with demountable rims. Brakes are a service brake of the external contracting type and an emergency brake of the internal expanding type, both operating on the rear wheels. Springs are semi-elliptic, 41 in. x 2 in. front and 50 in. x 2 in. rear.

The steering gear is of the worm and gear type. The 18 in. steering wheel is on the right side with the control levers in the center. The wheelbase is 106 in., the tread is 56 in. Equipment includes 3 electric lights, storage battery, horn, tool kit, jack, speedometer and extra rim. The price of the chassis is $1500. Open express or stake body is furnished at $150; panel body at $300.

NEW 2500-LB. CORBITT TRUCK

The Corbitt Automobile Company, Henderson, N. C., has added a new 2500-lb. truck to its 1914 line.

The motor is four-cylinder, four-cycle and develops 30 h. p. Cylinders are cast en bloc, and have 3¾ in. stroke and 5¼ in. bore. Ignition is by a Splitdorf high tension magneto. A 1¼ in. Stromberg carburetor is used. The constant level splash system of lubrication is used. A plunger pump and cellular type spring suspended radiator are used for cooling.

The clutch is of the leather faced cone type, with springs under the leather to make engagement easy. The transmission is of the selective type, giving three speeds forward and one reverse, and is carried on annular ball bearings.

A double universal jointed shaft connects the clutch and the transmission, which is on the jackshaft. Final drive is by side chains from jack shaft to rear wheels. The front axle is an I-beam forging; the rear is rectangular, 1¾ x 2¾ in.

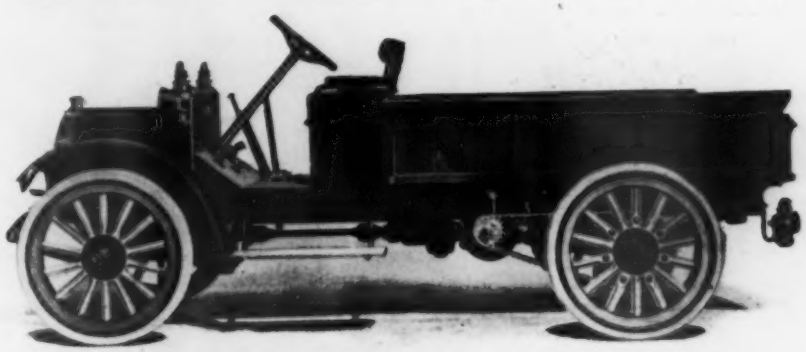
The wheels are 36 in. front and 40 in. rear, with 2 in. spokes, 36 x 3½ in. front and 40 x 4 in. rear; solid demountable tires are used. Springs are semi-elliptic. Both brakes act on the rear wheels. The service brake is of the contracting type; the emergency of the expanding. The frame is pressed steel channel section, 4 9-16 in. deep, and is heavily braced.

The steering gear is of the irreversible type. The drive is on the left side with the control levers in the center. The oil lamps, horn, jack and tools make up the equipment. The chassis price is $2000.

THE GAY COMMERCIAL CAR

This 1500-lb. capacity truck is an addition to the line built by the S. G. Gay Company, Ottawa, Ill.

The motor is of 25 h. p., four cylinders, 3¾ in. bore and 4 in. stroke, of the L-head type, cast in pairs, and is located



The Gay Fifteen Hundred Pound Truck, Fitted With Express Body

under the hood. A float feed type carburetor is used. Lubrication is by the full splash system. Ignition is by a high tension magneto with fixed spark. Cooling is by a spring-suspended radiator and pump.

The clutch is a 14 in. leather faced cone, with auxiliary springs. The transmission is of the selective type, giving three speeds forward and reverse. Heat-treated alloy steel gears and shafts are used. The jackshaft is 1¼ in. nickel steel. Drive is by double chains from jackshaft sprockets to the rear wheels. Front axle is I-beam, 1¾ in. wide and 2½ in. deep. The rear is rectangular 1½ in. x 2¼ in.

Wheels are fourteen spoke artillery type, 36 in. front and rear, fitted with 3 in. solid tires. A 14 in. external contracting service brake and an internal expanding emergency brake operate on the rear wheels. Both springs are semi-elliptic, 39 in. x 2 in. front and 48 in. x 2¼ in. rear.

Steering gear is of the worm and split nut type. The drive is on the left side, with the control levers in the center. The equipment consists of 3 oil lamps, horn, tool kit and jack. Express or stake bodies are regularly furnished. Body is 46 in. wide and 96 in. long back of driver's seat.

NEW YORK AUTO TRUCK

The Tegetmeier and Riepe Company, 771-773 1st Avenue, New York City, has brought out a 3000-lb. truck, which has a wheelbase of 129 in. and a loading space varying from 4 to 6 ft. wide, by 8½ to 10 ft. long.

The motor, of Rutenber make, is located in front under hood, with all parts readily accessible. The four cylinders are cast en bloc, and have a bore of 3¾ in. and a stroke of 5¼ in. Lubrication is by positive plunger and splash feed system. The pump and Bosch magneto are mounted across the front. The fly wheel is mounted with a powerful leather faced cone clutch and drives back to the transmission with a shaft having two universal connections. The transmission is of selective type, three speeds forward and one reverse, mounted on jack shaft. Drive is by chain from jack shaft to rear wheels.

The car is equipped with two sets of brakes, foot brake operating on jack shaft and hand emergency brake on rear wheel brake drums. The steering gear, of the irreversible type, with 18 in. wheel, is on the right side of car and this in connection with the foot operated throttle, makes an easily operated and controlled car.

Springs are semi-elliptic, double sweep, with relief springs at rear; they are mounted on an I-beam forged axle in front and a square section axle at the rear. Wheels are of the wood artillery type, with square spokes, fitted with 36 x 3½ in. solid tires in front and 36 x 5 in. rear. The frame is of channel section, reinforced by cross-members.

The equipment consists of lamps, rear license bracket, horn, tool box and set of tools. The chassis complete, in lead, is listed at $2100. Any style of body can be furnished.

The New York One and a Half Ton Truck. Price of chassis is $2100

The Postal Transfer Service, Inc., of New York City, has just purchased from the American Locomotive Company, eighty 3½ ton Alco trucks. These will be fitted with United States Mail bodies for transferring mail in New York City.

Five new Garford trucks were recently ordered by the Greenwood Cemetery Association of New York City, and are now employed in landscape gardening, grade work and road maintenance in the Greenwood Metropolitan Cemetery.

Commerce Truck Used for Work and Pleasure

Emil Arndt, of Dearborn, Michigan, uses a Commerce truck for utility work, making long trips during the week, purchasing stock in Wayne County and surrounding counties, and on Sundays utilizes the seats and takes his family out for a drive. This truck is the latest model made by the Commerce Motor Truck Company, of Detroit, Michigan, and is the second Commerce purchased by Mr. Arndt, both being in constant use.

The man who owns a gold mine is a fool not to work it,--- keep your trucks moving

SPECIAL BODY USED BY MILK COMPANY

Improved methods of hauling dairy products have resulted in corresponding improvement in the manner of caring for the loads while in transit. Progressive milk and creamery companies have kept pace with other lines of business in the adoption of motor truck delivery and there has been an interesting evolution in body development along lines that promote purity of the product, refrigeration of the load and convenience of access.

The familiar sight of the milkman dropping the reins and reaching for bottles among the baskets exposed to dirt and contamination, will soon disappear. At least it is a thing of the past with the Aines Farm Dairy of Kansas City, Mo., which uses White motor trucks and has developed a refrigerator milk body in which the certified supply is not only protected against foreign matter and temperature changes, but is contained in compartments which allow access to one part of the load without opening or exposing any other part.

An exterior view of the body gives no suggestion of the great precaution to insure cleanliness and a cool supply. The truck resembles a standard 1500 lb. panel delivery except for side doors that are built about midway of the body. Even when one of these doors is opened the protective feature is not readily recognized, because the doors open to an aisle or vestibule built transversely of the body.

Between the vestibule and a partition in back of the driver's seat, there is built a series of compartments with sliding doors that are practically air tight and each compartment has three tiers of sheet metal trays that slide in and out like the drawers of a desk. Nine of these trays are carried forward of the vestibule and twenty-four are carried in the rear section. With this arrangement the driver can get at the particular tray that is needed, while the others remain in complete protection.

Interior of Body, Showing Trays

Between each compartment and the roof, there is at least two feet of space which gives room for carrying the wire baskets that are used in deliveries to dwellings, besides furnishing an opportunity for ventilation above the compartments. Between the bottom trays and the floor of the truck there are drip pans and space has been allowed for thorough flushing and scrubbing.

The entire body, as well as the interior of the compartments, is double lined to maintain uniform temperature and guard against heat reaching the supply.

The combination of reliable motor delivery and scientific care of the load has proved so satisfactory to the Aines Farm Dairy that the company has purchased a second White truck of double the capacity and it is being fitted with an exact duplicate of the original body, except in size.

THE COWAN TRUCKING SYSTEM

The Cowan Truck Company, of Holyoke, Mass., has devised a new trucking system, which consists in having any number of inexpensive wooden platforms and a single all-metal transveyor to move the platforms when necessary, and is now manufacturing the transveyors.

The Cowan Trucking System
In use in the storage room of the Packard Motor Car Company, Detroit, Mich.

The prices of the transveyors range from $100 for the 2000-lb. type to $175 for the 3500-lb. type. Fibre wheels are furnished at $25 extra. The steel platform of the 2000-lb. type is 27 in. long and 14 in. wide. Its extreme length with the handle down is 78 in.; extreme width is 18 in. The extreme length of the 3500-lb. type with the handle down is 100 in.; the extreme width is 26¾ in. All the transveyors lift their platforms 1⅝ in. from the ground. A special type for use on rough floors is made with a 2¾ in. lift. Wooden platforms ranging from 23 in. x 22 in. to 30 in. x 32 in. can be used on the 2000-lb. type, while the range for the 3500-lb. type is from 33 in. x 40 in. to 44 in. x 60 in. About one hundred platforms can be used conveniently with one transveyor, although some firms use three hundred with two transveyors.

By this system when material is brought into the shop, it is loaded on one of the platforms until it is necessary to move it, then the transveyor is brought up, pushed under the platform

The All-Metal Transveyor Used in the Cowan Trucking System

and the load lifted from the ground by depressing the handle. When the destination is reached the platform is lowered without jar or shock, by stepping on the foot pedal shown in the cut, and the transveyor is free for further use. In this way the truckman uses no time in loading and unloading and can thus do the work done by several men using the ordinary trucks. These transveyors are much used in automobile plants.

The first of three Kissel Kar trucks purchased for freight and passenger traffic in the Ozark Mountains of Missouri has been delivered and placed in service. This truck operates between the towns of Houston and Cabool, a stretch of 20 miles over very difficult hills and unimproved roads. One round trip every day is made. Another truck will be used on the same run, so as to make two daily trips possible. The third truck will run from Hartville to Mansfield.

Trolley 'Buses at Merrill, Wis.

THE Merrill Railway & Lighting Company, of Merrill, Wis., contracted with the Field Electric 'Bus Company, No. 135 Broadway, New York, some months ago to build them a Trolley 'Bus after the style of those which have been successfully introduced in England and on the Continent the past few years, descriptions of several of which have appeared in this paper.

The Merrill Trolley 'Bus has been delivered and is now in successful service at Merrill, as is shown by the accompanying illustration.

The Field Electric 'Bus Company developed their Trolley 'Bus after the type of their successful Edison storage battery 'buses, which proved so satisfactory at Chicago.

The Merrill 'Bus is of the 18 passenger single operator pay-as-you-enter type, and equipped with a 500 volt 12 E. H. P. series motor, with a five-step railway type controller and resistances.

The motor drives by universal shaft and bevel gear to a jack shaft with differential and from there to rear wheels by chains as shown, making a very efficient drive. The 'bus has two sets of brakes of liberal size with equalizers. The 'bus rides, it is claimed, like a parlor car on its long flat springs and solid tires.

The current is taken from a double overhead wire system of positive and negative by two separate trolley poles of special type with a patent of swivel harp and base on very long trolley poles that give the 'bus a lateral freedom of movement in the street of 10 to 12 feet both sides of the trolley wires, thus allowing their entire freedom of movement through street traffic.

The 'bus at Merrill operates over a route of about a mile, connecting the company's regular system of street cars. It is planned to extend the 'bus system to other parts of the city and also into the country.

The total operating, maintenance and depreciation expenses of these 'buses on a service of 120 miles per day are 9 1-3 cents per 'bus mile for the 18-passenger type and which is 18 ft. 6 in. over all and 6 ft. wide. The 'bus complete weighs about three tons.

The 18 passenger type has side seats and a cross end seat. A larger type of

The Merrill Trolley 'Bus
Seating capacity, eighteen persons; averages one hundred and twenty miles per day

cross seat 'bus seating 24 to 30 passengers is also built.

There is no doubt but that the trolley 'bus and the storage battery 'bus offer to the street railway and other interests a wide field of usefulness as developers of new territory and for service on boulevards and parkways and as a relief to the congested traffic conditions of many of our cities.

E. S. King, secretary and general manager of the line says in regard to the 'bus: "It operates in and out through street traffic without any trouble whatever, or without the trolleys coming off, having a lateral width of operation in the street of twelve feet or more each side of the trolley wires. Our motormen claim that for five days the trolleys have not left the wires except when taken off. These five days the 'bus was running regularly sixteen hours per day.

We save an investment in track of $7000, the interest, repairs and depreciation on same, $400 (about 40 per cent.) per year in power, as compared with a rail trolley car. Our total saving taking all into consideration, cannot be less than $1400 per year, or about 3½ cents per car mile.

There is less chance for accidents, as the 'bus can be stopped in a much shorter space and can be turned out to save a collision.

We take care of our patronage with the 'bus just as well as if our track was extended and a rail trolley car used, and we figure on making several extensions to our trackless trolley system.

The following are figures prepared by the Merrill Railway & Lighting Company operating the 'bus and shows the cost of operation, maintenance and depreciation.

Operating Expenses

Operators per mile	$ .024	
Electric current	.0102	
Storage, cleaning and supplies	.0135	
Total operating		$ .0477 $ .0477

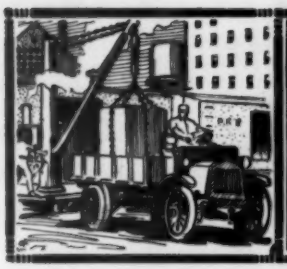
Maintenance and Depreciation

Depreciation on 'bus and line per year	$600.00	
Tire renewal per year	$800.00	
Repairs & gen. expenses per year	700.00	
Total per year	$2100.00	$ .0477
Grand total per 'bus mile		.0954

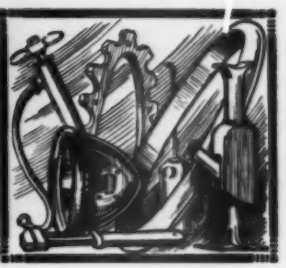
Average mileage per day, 120.

If the company secures the year's tire guarantee that the tire companies are offering now the maintenance and depreciation will be reduced more than 1.6 cents per mile, making a total of all expenses 8 cents instead of 9.5 cents per mile.

Knox-Martin Tractor Used by the Mt. Vernon, New York, Fire Department
The old equipment is used; this effects a great saving in motorizing the department. It costs about $72 a month to haul the apparatus by horse, while with tractors it costs less than $2 a month

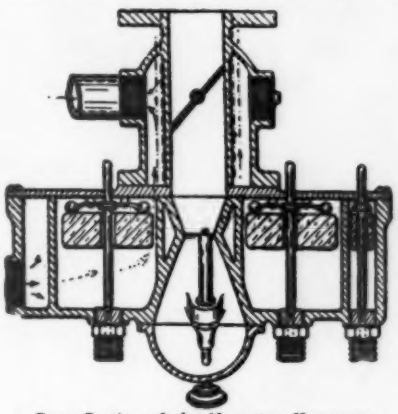


TRUCK ACCESSORIES AND APPLIANCES



A NEW KEROSENE CARBURETOR

The Hampton Kerosene Carburetor Company, of 1876 Broadway, New York City, claims that its kerosene carburetor utilizes kerosene, alcohol, gasoline and



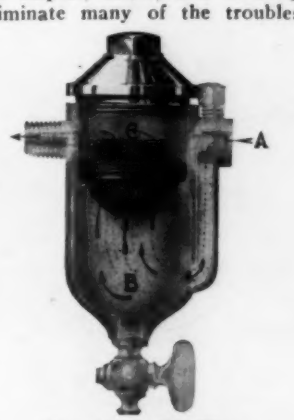
Cross-Section of the Hampton Kerosene Carburetor

The arrows show the course the exhaust heat takes through the carburetor. One of the float chambers is for kerosene the other for gasoline. The chamber on the extreme right is for water.

distillate. The principle of this carburetor is that instead of gasifying the fuel it atomizes it. The auxiliary air valve has double adjustment. The prices vary from $40 for a 20 h. p. engine to $125 for a 125 h. p. engine. This carburetor may be applied to marine and stationary engines, single or multiple cylinders, vertical or horizontal, throttling or hit and miss governors.

A NEW GASOLINE FILTER

The Attwood filter and separator is a product of the Attwood Brass Works, Grand Rapids, Mich., and is designed to eliminate many of the troubles in



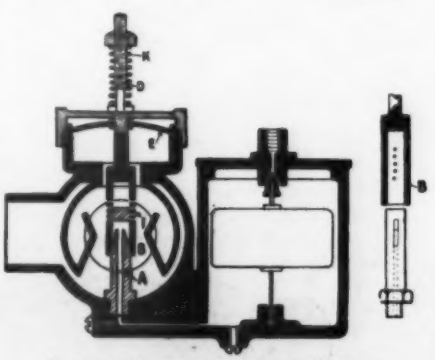
Attwood Gasoline Filter

operating a gasoline engine by retaining in the settling chamber "B" scale, rust, sand and water that forms in the gasoline tank by atmospheric condensation. The gasoline enters through passage "A" into chamber "B," and this being of ample size allows of all foreign matter, heavier than gasoline, to settle to the bottom, to be drained off when desired by opening pet cock. The lighter and purer oil then arises to the top, and passes through the filter gauze and special cloth in chamber "C" and to the carburetor. The construction is such that when necessary, all parts can be taken out without special tools or wrenches. This device sells for $2.

THE HOBBS CARBURETOR

A carburetor whose distinguishing feature is the automatic flexibility of the fuel intake is being placed on the market by Dr. J. O. Hobbs, of 2349 South Central Park Avenue, Chicago, Ill.

This carburetor has float feed and poppet valve controlled auxiliary air inlet. The fuel nozzle is a perpendicular pipe A, controlled by sliding ring valve B, which has lateral perforations I, and is attached to threaded stem D. To this stem is attached a flexible diaphragm E, which is clamped to periphery of opening in carburetor chamber, its upper sur-



Sectional View of the Hobbs Carburetor

face exposed to the atmosphere. This diaphragm is held against atmospheric pressure by a coil spring identically as is the air poppet valve which can be adjusted in the same way—by a knurled nut compressing the coil.

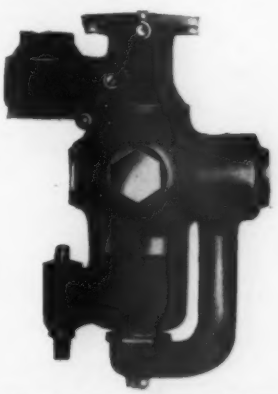
The area of fuel intake increases as the valve is depressed and this depression is directly proportionate to the degree of vacuum in the mixing chamber, which in turn, is proportionate to piston speed. Conversely decreasing piston speed gives less suction and proportionate lessening of fuel inlet area.

To obtain uniformity of air and fuel mixture, their respective inlet areas should be directly proportionate to each other. In this carburetor the area of fuel intake is in direct proportion to piston speed. A properly designed poppet valve will give air inlet area also proportionate to piston speed. Both air and fuel intake areas being proportionate to piston speed, they will be proportionate to each other.

Simplicity and ease of adjustment is claimed for this carburetor, also more flexibility and fuel economy.

THE HARROUN KEROSENE CARBURETOR

The carburetor shown in the accompanying illustration will operate on either kerosene, motor spirits, gasoline, or any mixture of these fuels. The adjustment necessary to change from one

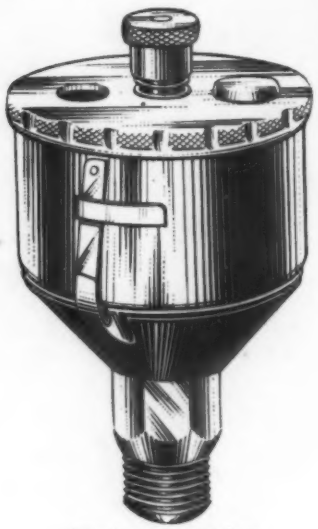


Ray Harroun's Kerosene Carburetor

fuel to another is only that which can be made from the cowl board. It is necessary, however, when starting on these carburetors to use some sort of priming device such as Prest-O-Gas or gasoline. The car will run just as slow on kerosene as on gasoline, it is claimed, and will increase the mileage to a certain per cent. The carburetor is known as the Harroun kerosene carburetor, and is manufactured by the Ray Harroun Company, of Tenth and Canal Streets, Indianapolis, Ind. The prices of these carburetors vary. For a 1¼ in. size, vertical type, the price is $28 and for the 4 in. type, $36. There are seven sizes, however, between these two and cost in proportion to their size.

A NEW LOCKING GREASE CUP

The meritorious feature of this new grease cup is that it can easily be filled and a patented locking device absolutely prevents the cap from shaking



The Agner Grease Cup
This cup can be filled in a few seconds' time with a grease gun, without removing the top

off. This cup is made by the Raymond C. Agner Company, of Burlington, Wis.

By pressing downward the knurled burr on the top of cup and then turning it around either way until the inside disc matches with a hole in the top of the upper cap, the cup can be filled by forcing grease or oil into it by putting the nozzle of a grease gun into the hole. After removing the nozzle press down the burr nut and turn it half way around when it will lock itself and close up the opening.

The locking device consists of a lever on the side of the cup so arranged as to regulate the top cap when it is being turned back. It has an automatic stop that allows the top to turn off to the correct distance and lock at this point, and it is seen that the cup is ready to have a full charge forced into it. If the cups are to be filled by hand or the old way, by swinging the lever to one side it will allow the upper cap to be removed as all other cups, and after screwing cap on again the lever is pushed back and by so doing the top is made secure so that under no conditions can the cap vibrate off.

KOETH'S INTERCHANGEABLE TOOL

The Currier-Koeth Manufacturing Company, Coudersport, Pa., is manufacturing an interchangeable tool, whereby one pair of handles is made to serve a number of different tools, which come as sets of heads. By means of an interlocking device, the handles may be fastened readily to any set of heads, and the heads so combine as to form fifteen, or more, different tools. A kit consists of one pair of handles and six sets of heads. The heads are made of tool steel, drop forged, ground, tempered and highly polished. The handles are of tool steel, ground and polished. The tool measures from 10 to 11 in. in length, depending upon the different heads. Complete in midget chest or tool roll, the price is $3.

NEW V-RAY SPARK PLUG

Featured here is the new V-Ray Mica-Lava spark plug, manufactured by the V-Ray Company, Marshalltown, Ia.

This plug is unique in that it has no mica or porcelain exposed to the cylinder's heat or oil. The stocky mica core is merely exposed to the outer atmosphere above the plug proper, while the portion that is exposed to the disintegrating effects of heat, oil and carbon, is in this V-Ray type, imbedded and baked into a solid cone of bleached and glazed lava. Another feature is the absence of strain on the lava conical tip. No gasket strain is placed on the lava, the compression seating being against the mica only, as shown by cut.

New V-Ray Spark Plug

The electrodes are of genuine Meteor and are guaranteed against fusing or burning.

BATTERY CONDITION INDICATOR

With the modern electric lighting, or lighting and starting system, it is obviously necessary to install some indicating means to tell in what condition the battery is, whether it is charging, discharging or no current is flowing.

The "C. O. D." Indicator

One of the most novel instruments recently brought out to indicate these conditions is the new C. O. D. Indicator, manufactured by the Roller-Smith Company, 203 Broadway, New York City. It will be observed from the illustration that the dial is pierced with a rectangular opening through which, in the condition shown, appears the word "off."

When current flows through the device, whether it is as small as the minimum which the generator delivers, or as large as maximum generator output, the word "off" snaps out of sight and is replaced by "charging." There is thus equally unmistakable announcement that the battery is receiving its charge. When the battery is called upon for its function of delivering energy, the reversal of current flow through the instrument which this involves throws the signal to the third of its positions, namely, "discharging" where it remains as long as the demand persists.

No springs, cams, or mechanical multiplying means are embodied, and there is no movable conductor, in fact there is but one moving part. The circuit through the instrument is a heavy copper strap of a cross section greater than that used for the ordinary wiring circuit, so that the losses are entirely negligible and there is no possibility of a burn-out.

The Koeth's Interchangeable Tool Outfit

PURFEX CARBON TABLETS

Purfex Carbon Tablets are put up in packages containing seventy-two tablets, retailing at $1.50. The spark plug is removed from one of the cylinders and six of the tablets dropped in. This is done while the motor is hot. The plug is then replaced and the engine let

Purfex Carbon Tablets

stand for a few minutes to allow the tablets to melt. The engine can then be started up and the carbon will go out the exhaust in the form of black smoke and small particles. This operation is repeated on the other cylinders. Made by the Purfex Sales Company, Box 2645, Station J, Philadelphia, Pa.

A NEW UNIVERSAL BLOW TORCH

This torch is fitted with a number of improvements which adapt it for all conditions of service, and it is therefore called a Universal Blow Torch. A cross sectional view of the torch is shown in the accompanying cut. The burner is made particularly heavy so that it will retain its heat and keep the torch burning in cold or windy weather. The drip cup is made especially deep so that it will start the torch under bad weather conditions. Another feature of the torch is the self-cleaning burner valve. The needle at the end of the valve stem cleans the hole automatically when the valve handle is turned. The valve seat, which is a separate replaceable plug, need therefore, never be injured by picking at the opening to clean it. The handle of the valve is of fibre. This handle does not get hot, nor does it crack, loosen, char or burn. The tank is of very heavy gage brass and is reinforced with an extra corrugated brass disc covering the entire inner surface of the tank pot. This insures the tank keeping its shape under very rough handling. The pump valve works in a cylindrical guide which assures the perfect seating of the valve. It can be taken apart and any part replaced separately. This torch is manufactured by the Westinghouse Electric & Manufacturing Company, of East Pittsburgh, Pa., and is made in quart and pint sizes.

J-M MASTIC FLOORING FOR GARAGES AND WAREHOUSES

The H. W. Johns-Manville Company, New York City, is calling attention to its J-M Mastic Flooring as a most serviceable and durable material for covering garage, warehouse, machine shop and other floors that receive considerable wear. It is made in any consistency between extreme hardness and softness and, while always dense, possesses a certain amount of resiliency. It is waterproof, and practically wearproof under ordinary service conditions, being unaffected by acids, alkali and brine.

On account of its noiseless character is a boon in plants where there is considerable trucking. Another feature in its favor is its peculiar holding quality which prevents slipping. It is made in thicknesses from 1 in. to 3 in.

THE HERZ AUTOMATIC TIME ADJUSTMENT FOR MAGNETOS

This device is especially recommended for commercial cars, its object being to automatically advance the time of ignition in accordance to the speed of the

The Herz Automatic Time Adjustment
Showing the five steel balls and one of the discs

The Herz Automatic Time Adjustment
This view shows the driving side of the coupling. The curved grooves in this disc run in the opposite direction from those in the companion disc.

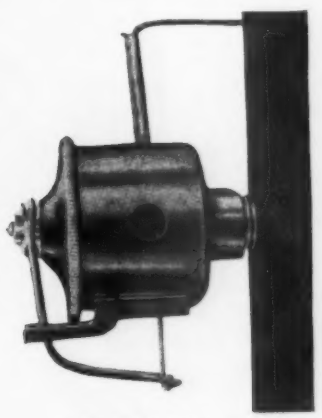
motor, thereby giving a maximum output of power with a low consumption of gasoline.

The construction of the device is very simple. It consists of a coupling made up of two juxtaposed discs, each disc being provided with five curved grooves. The five grooves in one of the discs run in opposite direction from the five in the companion disc, and between these grooves five steel balls are placed. These balls act like weights of a governor, being forced outward from the center by the centrifugal force in direct proportion to the speed of the motor, and in this way impart a twist to the armature of the magneto in relation to the driving shaft. Any desired degree of adjustment can be obtained by altering the curves in a suitable manner. All the parts of this automatic time-adjustment are made to gage, so as to be interchangeable and are of hardened and ground tool steel. The price of the device is $20.

Sectional view of the Westinghouse Universal Blow Torch, with self-cleaning burner valve

A NEW GASOLINE SAVER

The Still's Automobile and Accessories Company, of 1926 Broadway, New York City, is manufacturing the Scudder Gas Saver. It is claimed that this small device saves 20 per cent. of the gasoline by causing better combustion.



The Scudder Gas Saver

This is done by introducing air into the manifold and retarding the flow of gas from the carburetor. It also supplies the proper mixture at all times and will work as a brake when going down hill. It is attached to the manifold a few inches above the carburetor and is operated by a flexible cable from the dashboard.

"NO-COROD" METAL BALLS

The Standard Roller Bearing Company, Philadelphia, Pa., has produced a new non-corrosive, non-rusting ball called the "No-Corod" metal ball. The metal from which these balls are made is twice as hard as brass or bell metal and 10 per cent. harder than bronze and has a much greater resistance to corrosion. These balls can be used for valves, grease cups, carburetors or for light anti-friction bearings, where the loads are light and other conditions favorable. These balls are made in sizes from 1-16 in. to 4 in. in diameter, .001 in. limit of error.

THE A-B DOUBLE UNIT SYSTEM FOR STARTING AND LIGHTING

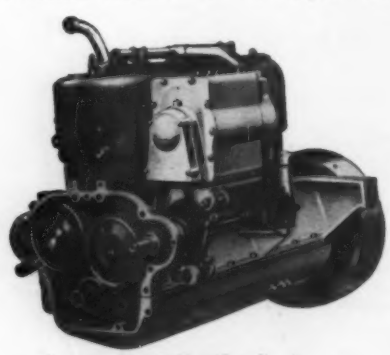
The A-B Double Unit System for lighting and starting commercial cars consists of a motor for starting the engine, a generator for charging the battery and a storage battery. The system operates at 6 volts in connection with a 6 volt 120 ampere hour battery. The three units are light in weight and can be so distributed in a small car that no excessive strain is placed upon any part of the car. The weight of the units are motor, 60 lbs.; generator, 19 lbs.; battery, 71 lbs.

The construction of the machine is simple and rugged. The motor possesses ample power for spinning the engine for a sufficient length of time to insure positive starting. The generator is of ample capacity to keep the battery fully charged.

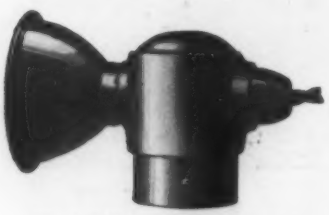
The motor is a series wound machine of rugged construction and free from all complications. It is designed to give a heavy starting torque and ample power at operating speed. It is connected to the engine through a 20 to 1 gear ratio. The motor is started from the driver's seat by pulling in a simple single throw switch, and after the engine has picked up it requires no attention from the driver.

The generator for charging the battery is geared directly to the engine shaft in the ratio of 2½ to 1. It begins charging the battery at a speed of 1200 r. p. m. and reaches the peak of output curve at about 4000 r. p. m., giving a maximum charging current of 12 amperes. The machine is cut in at low speed by the raising of a heavy piece of steel which positively establishes the circuit and which is so heavy that when the machine slows down, there is no possibility of the circuits remaining closed and discharging the battery uselessly. After the initial cut-in there is no making or breaking of the circuit until the machine again slows down for stopping the car.

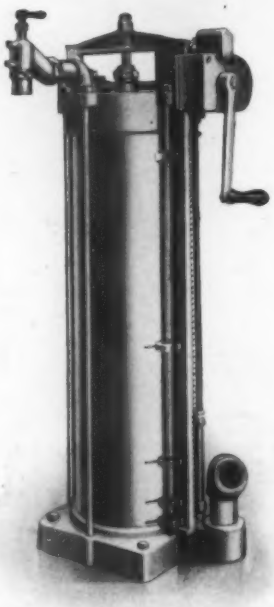
The steel contact making piece also acts as a magneto shunt for regulating the output of the generator. At a speed above 4000 r. p. m., generating a maximum charging current of 12 amperes, the magnetic shunt is pulled up against the pole piece of the machine, causing a sudden reduction of the output current. The battery is thus provided against overcharging at high speed. This outfit is manufactured by the Adams-Bagnall Electric Company, of Cleveland, O.



A-B Generator
Geared directly to engine shaft at 2½ to 1



The A-B Magnetic Handy Lamp



The Bowser Ten-Gallon Pump
This pump will handle gasoline, kerosene and other oils and will deliver any quantity desired by simply setting the quantity stops.

Autolock Switch With Kick Lever
The Blackburn Specialty Company of 1120 Prospect Avenue, Cleveland, Ohio, has just brought out a new type of its "Autolock" switch, fitted with a kick lever, as illustrated. The kick lever can be turned only when the key is inserted and it is impossible to stop the car without kicking the lever over to the neutral position, at which point only, the key can be removed.

The switch can be adapted to either high or low-tension ignition and is attached directly to the dash of the car with the mechanism back of the dash and only the face plate of the switch showing.

A TEN-GALLON PUMP ADAPTED FOR ALL KINDS OF LIQUIDS

The accompanying illustration shows a 10-gal. pump which has recently been put on the market by S. F. Bowser & Company, Inc., Fort Wayne, Ind. It is designed for handling gasoline, kerosene and other oils in garages, general stores, factories, or wherever it is desirable to have an equipment that will discharge the liquid rapidly and accurately in predetermined quantities. Ten gallons are discharged at one full stroke of the plunger, and the pump is so designed that the plunger is returned to its original position with only a few quick revolutions of the handle. The pump works very easily and requires but little effort to pump the full 10 gallons. This means a great saving in time to the operator. If desired five, two, one, or one-half gallon can be discharged by setting the quantity stops, which can be done by a quick, easy adjustment of the quantity stops as shown in the illustration. The pump, while made entirely of heavy metal, is of neat design. It is finished in red enamel, for volatile liquids, with nickel trimmings.

A locking device is located in the head of the pump, which securely locks the pump, preventing the drawing of liquid by unauthorized persons. It is also equipped with a continuous counter, which registers all liquid drawn up to one hundred thousand gallons.

The pump is designed to be connected to the Standard Underground Storage Tank as manufactured by S. F. Bowser & Company, the tank to be located at the most convenient point.

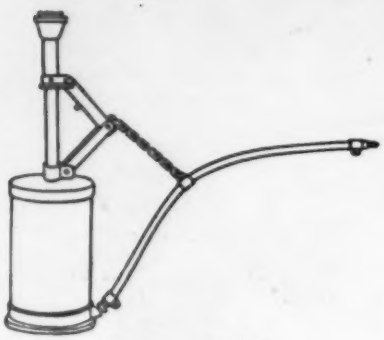
A MAGNETIC REPAIR LAMP

The accompanying illustration shows a handy repair lamp which has recently been brought out by the Adams-Bagnall Electric Company, of Cleveland, O. The feature of this lamp is that it will stick on any part of the car, which is made of iron or steel. The magnet has a 13 lb. pull, while the weight of the lamp is 13 oz. The silver-plated reflector is 2½ in. across the face. The magnet is covered with aluminum. The lamp is fitted with cord and terminals so that it can be connected to the battery terminals.

A-B Motor
Simple series-wound machine

A JACK THAT IS OPERATED BY COMPRESSED AIR

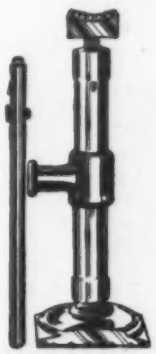
One of the latest novelties in the jack line to make its appearance, is a jack that may be operated by a hand pump or preferably with compressed air from a tank. It is claimed to lift the largest car—with 100 lbs. pressure in the tank—in a second. When the car is raised the jack locks automatically—while a slight pull on the tubing attached to jack will unlock it and allow the car to descend gradually. It is made of brass and is neatly finished. The Durno Manufacturing Company, of 163 St. Paul Street, Rochester, N. Y., makes it.



The Durno Air Jack

CROSBY'S RATCHET SCREW JACK

The screw jack shown in the illustration is manufactured by the Crosby Company, of 2122 Vodeli Street, Pittsburgh, Pa. This jack will raise a weight of six tons and has a clearance of 13 to 20 in. When the jack has been raised the handle may be removed. This prevents any tampering or accidents. In raising, the handle, which has a ratchet on its end, is moved from left to right. The ratchet engages the cogs and as the handle is moved the jack raises on a thread. In lowering, the handle is placed in upside down and moved from right to left. The double acting ratchet screw jack shown is called No. 2, and sells for $3.75. It weighs 10 lbs. and contains a screw 1 in. in diameter. There are also six other sizes made. They range in price from $3 to $15.



Double-Acting Ratchet Screw Jack, which will lift a weight of 6 tons 7 inches

The Vital Spark Plug

THE KANTALEVER EMERGENCY SPRING REPAIRER

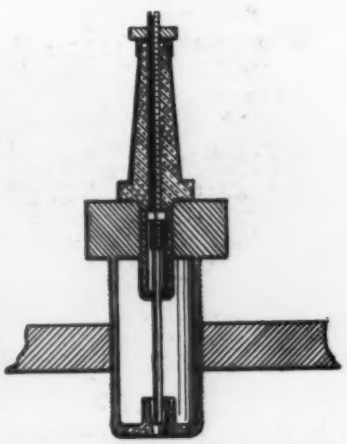
This cut shows the repairer attached to a spring broken in the center at the spring bolt, which is a common occurrence. This repairer is attached in a few minutes and can be applied to any part of the spring that is broken. The repairer has adjustable clips so that it fits any width spring. It is made of 50 point carbon steel. The Kantalever Emergency spring repairer is manufactured and distributed by the Motor Car Equipment Company, 55 Warren Street, New York City.

The Kantalever Emergency Spring Repairer

A NEW PISTON RING

The ring here shown is manufactured by the Automobile & Accessories Manufacturing Company, 816 West North Avenue, Baltimore, Md. There are three V-shape grooves cut around the face of the piston ring making the bearing face just half of the ordinary ¼ in. piston ring. The manufacturers claim that by reason of the V shape of the ribs the ring will wear itself to a fit very quickly, and after the edges are worn off the wear will be very slow and gradual, that the oil filling the grooves will perfectly lubricate the ring and cause it to wear almost indefinitely, and that the oil filling the grooves will prevent compression leakage.

New Piston Ring, with grooves in face to reduce the bearing surface



The Aurora Spark Plug, with adjustable core

THE VITAL SPIRAL SPARK PLUG

The particular feature of this plug, which is manufactured by The Bigsby Manufacturing Company, of Cleveland, O., is that it can be used in cylinders having extra heavy walls, in which case a regular plug would be too short. The spark can be placed at any desired distance by simply adjusting the spiral wire. If too long, the operation simply consists in pushing back the spiral and cutting off the central electrode whatever amount necessary.

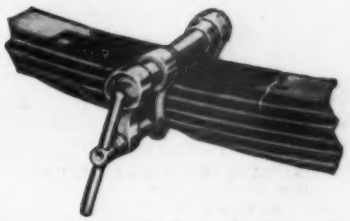
The spiral piece of this plug is constructed of small diameter nickel wire, which will not gather carbon or become excessively heated causing pre-ignition. The makers claim there is no possible chance of warping, pre-ignition or carbonization.

THE AURORA SPARK PLUG

The Aurora Vulcan Company, Security Building, Bridgeport, Conn., is manufacturing a new spark plug shown here, which has an adjustable core. In this way the electrodes can be adjusted by means of a screw driver while the engine is in operation. The manufacturers claim that the pressure of the cylinder, by being forced into the small hole in the bottom of the plug serves to clean contact points and thus give a hotter spark, and save gasoline. These plugs retail at $1.25.

THE ANN ARBOR SPRING LEAF SPREADER

The Spring Leaf Spreader here shown is intended to replace the cold chisel and hammer in separating spring leaves. The manufacturer claims that it is not necessary to jack up the car when using this device, and that it separates the leaves just enough to insert the lubricant. It is made of drop forgings, nickel plated and polished and well finished. It weighs less than a pound, retails at $1.50, and is manufactured by the Spring Leaf Lubricator Company, of Ann Arbor, Mich.



Spring Leaf Spreader, for use in oiling springs

WHITE TRUCK EFFECTS A 33⅓ PER CENT SAVING IN A YEAR

Substantial economies in the hauling of paving material and supplies have been effected by the Warren Brothers Company, a paving contracting firm of Boston, Mass., with two White trucks of five tons capacity and one of 3000 lbs. In less than a year's experience and without materially changing the facilities that had been developed for horse service, the officers of this company have reduced their hauling costs 33 1-3 per cent., and placed their order with the White Company for three additional trucks. Ten of the twelve horses that were formerly maintained by this Company have been supplanted, and a considerable part of the wagon equipment has been adapted to the use of trailers with satisfactory results.

When horses were used exclusively, the operations of the company were limited to a ten mile radius from the center of Boston, and the greater part was inside a seven-mile radius including about seventeen adjacent cities. This limit of carting distance has been due to the fact that the bitulithic surfacing material is mixed at a temperature of 300 degrees, in the Cambridge yard, and must be loaded, hauled and dumped before it cools.

This work can be done only in dry weather, making it necessary to have the hauling done as expeditiously as possible It must be delivered in practically the same consistency as when it is unloaded from the mixer into the dumping body of the truck. It is therefore a proposition involving mixing, loading, hauling and dumping with the minimum loss of time.

With several jobs in progress at the same time the utmost reliability is demanded of the trucks. It is apparent, therefore, that losses of time which are inseparable from any animal installation, mean a considerable loss of money. On the other hand, the company figured that a motor truck, in order to be preferable to horses, must actually earn $15 a day.

Warren Brothers Company Utilizing Their White Five-Ton Truck For Hauling Supplies and Tools

Careful figures which have been compiled by the company covering both horse and motor truck installations show that each White truck did the work of three two-horse teams and occasionally four teams. When trailers were used the trucks supplanted five and six teams, according to the character of the work and the distance of the haul. The use of trucks, furthermore, extended the area in which paving contracts could be made, and on one occasion, a contract was performed in Haverhill, 38 miles distant. The trucks were used to carry tools and equipment both ways, saving freight charges and considerable time.

Both of the dump trucks are built with sheet steel bodies of special design, but they are elevated by the standard White power dumping mechanism, which allows an angle of 45 degrees. The bodies are 11 ft. long, 6 ft. wide and 18 in. deep, having a capacity of 100 cu. ft. The paving material weighs about 100 lbs. to the cu. ft., making a full load exactly 5 tons. The 3000 lb. truck is fitted with a regular stake platform body.

Five-Ton White Power-Dump Truck, Used by Warren Brothers Company, Boston, Discharging Paving Mixture of Crushed Stone, Gravel and Fluid Asphalt

TAXI'S MUST FIND PERMANENT STANDS

By an order of Commissioner Gillespie, all taxicabs or cars intended for hire in Detroit must have permanent stands after August 15. Owners of vehicles must arrange with property owners in front of whose places they wish to locate, subject to the approval of the police. If they desire to locate taxicab stands in front of city property they must obtain permission from the common council.

The Thos. B. Jeffery Company, of Kenosha, Wis., has just added a giant cross compound engine, directly connected to a huge alternating generator, to its power plant. This new unit, which comprised in shipment fourteen car loads, with a total weight of over one-half million pounds, has a capacity of 2200 h. p., and will have for its foundation a concrete block weighing approximately three million pounds. The fly wheel of the engine, owing to its high rim velocity of seven thousand feet per minute, it cast entirely of steel. Its diameter is 23 ft. and it weighs sixty tons. The generator alone has a total weight of over seventy tons.

The cement to be used in the construction of the new Capitol building at Jefferson City, Mo., will be hauled by a three-ton Kelly truck. Sixty days will be required for this work, and the contract calls for two carloads to be delivered per day. Louis G. Schell, to whom the contract was awarded, is said to have put in a bid very much lower than those quoted by contractors using horses.

Motor Truck Design for the Novice

By C. T. SCHAEFER, Member Society Automobile Engineers

This is the first installment of a series of articles by this well-known writer, covering in a nontechnical way the various constructions now current practice in commercial car design. These articles will take up, in order, the general types of chassis, the advantages and disadvantages of each, illustrated by simple diagrams, and in logical order, motor construction, ignition, carburetion, cooling, lubrication, etc., until each part of the truck has been dealt with.

PART I.

IT has not been until the last five years that the commercial car has achieved any great practical success. Since that time, however, the progress of the industry has been very rapid, until the present day when these vehicles are used in all lines of business, varying from the small retail merchant to the largest manufacturer and jobber.

Any commercial car conforming to the accepted standard of construction may be divided into two parts, the chassis and the body. The chassis or running gear as it is sometimes called, consists of the frame, power plant, springs, axles, wheels, brakes and, in fact, all units which enter into the propulsion and control of the vehicle.

There are three general types of chassis when classified according to the type of power plant, the gasoline, the steam and the electric. The gasoline propelled is by far the most prominent and will be considered in this series of articles.

As mentioned above, the first subject for discussion will be the general arrangement of the chassis. The principal points to be considered under the heading are as follows: General structure of the chassis, location of driver's cab in relation to the location of the motor, distribution of the paying load. The latter in a way affects the over-all length of the vehicle, which also affects the turning radius.

The principal problem confronting the commercial car builder is how to make use of the over-all length of the chassis to best advantage, considering accessibility and all other factors which may enter this problem.

Some designers have placed the driver's cab back of the motor. This necessitates the making of the total length of the machine somewhat greater than it would be for the same capacity were the driver's cab placed above the motor. Others have effected a compromise between these two and have placed the steering wheel and driver's seat at the right or left side of the hood, thus saving about half of the space used in the design which has the cab placed in the rear of the motor.

Each engineer has a number of arguments in favor of his design, all of which have merit. The maker who places the cab over the motor, claims that by this arrangement the load is shifted somewhat forward and the center of gravity is brought somewhat nearer the center of the machine. This makes far more even tire wear all around, and a reduction of the total over-all length of the chassis. The last is an advantage, as it gives the truck a shorter turning radius.

The maker who places his cab in the rear of the motor comes forward with the claim that in the other construction too much weight is placed on the front axle, that his motor is more accessible and that it is placed higher in the frame. The front springs can be made somewhat lighter, since they do not have to carry as large a percentage of the load. And being lighter, they are less stiff and take up the shocks of the road more readily, which tends to reduce the motor wear. These widely varying views of the makers are echoed in many different lengths of commercial vehicles which they have brought out.

Probably no single feature of commercial car design merits more attention than does that of arranging the power plant in such a manner as to offer the user motor accessibility in the greatest degree consistent with reasonable compact design. The importance of the first desideratum will be admitted by all who may have had experience in the operation of an internal combustion engine. The day is still far distant when a gasoline engine may be locked in a box and with a supply of "essence" be expected to mote satisfactorily until like the justly famous Shay, its multitudinous parts give out simultaneously as a result of legitimate wear. The desirability of compact arrangement will be endorsed as a purely academic proposition and will be heartily subscribed to as a thoroughly practical feature by truck operators, who have had to deal with metropolitan street and garage conditions.

As far as the power plant arrangement is concerned American makers have formed themselves into three distinct classes. First, the class comprising those who place accessibility above all other considerations.

Second, the class comprising those whose greatest satisfaction arises from the contemplation of a design in which the compact arrangement of parts is accentuated.

Third, the class comprising those who have attempted to effect a compromise between the above two types, to secure both accessibility and compactness.

Advantages of Motor Under the Hood Type

A layout of the trend of the first class of commercial car design is depicted in Fig. 1. It will be noted that the motor is carried under a removable hood in front of the driver's cab and control elements, being typical of current pleasure car chassis design. The loading platform is divided in approximately equal parts fore and aft the rear axle. This design permits of easy access to the motor and its accessory parts from the top and sides, making it equal in point of accessibility to pleasure cars of coupled construction. The driver's cab is also accessible, while clutch and change gear can easily be reached through the floor boards when they form a unit with the motor. The paying load is concentrated upon the rear or driving wheels, resulting in good traction and easy steering. This type of construction also results in a pleasing appearance, which is of some advantage in the smaller vehicles, which are used to some extent as an advertising feature.

Disadvantages of This Type

Like all other constructions the above type offers certain disadvantages. The over-all length of the vehicle must be greater in order to permit the location of the motor under a removable hood. In many cases this added length does not operate as a decided disadvantage for average application in which the machine must be maneuvered, in narrow thoroughfare, backed up to curbings and garaged in valuable space, every inch of added length makes itself felt in the owner's purse. With the question of load distribution it may be said that careless freight handlers are just as likely to place the light, bulky portion of a miscellaneous load forward of the axle and to burden the overhang with heavy material,

occupying little space, as they are to reverse the order of loading. Concentration of both driving and load stresses to the maximum degree upon one pair of tires causes loss as far as tire economy is concerned.

Motor Under the Seat Type

Turning now to the type of construction representative of the second class of design we find depicted in Fig. 2, a vehicle in which the driver's cab and controlling elements are superimposed upon the motor space, the load being apportioned fore and aft the rear axle, in an approximate ratio of 2 to 1. The result of this load distribution is that it does not permit of a traction ratio so high as does the previously described type, and steering is perhaps less sensitive. But when the high friction coefficient of rubber is considered upon average road surface and the fact that roller bearing steering heads are to be found in most commercial car axles of modern design, then these two conditions become relatively important. In respect to the load distribution, the latter construction possesses advantages over the first type. For a given loading space the construction shown in Fig. 2 permits of marked compactness in over-all length, with the attendant advantage of ease of handling minimum projection into thoroughfares when backed up to a curb and economy of garage space.

Lack of Accessibility

These relative advantages are gained at the expense of motor accessibility. Doors or removable panels are usually fitted to allow access to the motor from the side, while the floor boards usually permit very limited access from the top. When front fenders are provided the access from the side is also materially reduced. This notable lack of accessibility arises, first from the necessity for a rigid and fairly bulky superstructure for carrying the driver's cab, and in the second place from the fact that a maze of control levers, brackets and rods are frequently located in the space which should many truck builders have shown a marked be reserved for access to the motor parts and accessories. During the past few years

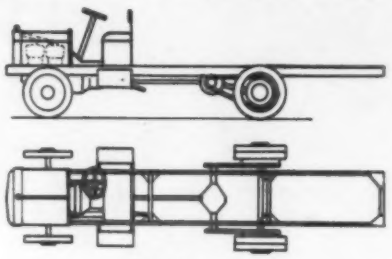


Fig. 1.

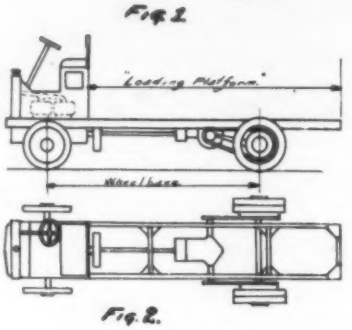


Fig. 2.

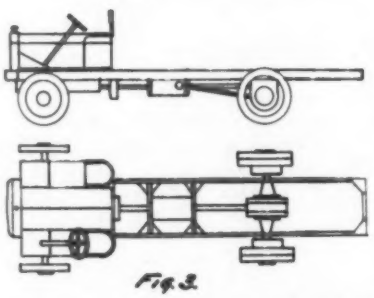


Fig. 3.

improvement in this construction, however; at best it leaves much to be desired in the way of accessibility.

Type Three a Combination

There is still another type, Fig. 3, which has lately been introduced, in which an attempt is made to combine the advantages of the first and second constructions is apparent. This has been accomplished in a measure, by mounting the motor in a more or less accessible position between the two seats. A removable hood is generally fitted, but the net result is almost invariably inferior from a standpoint of accessibility to the construction shown in Fig. 1, although from the same viewpoint it is an improvement over Fig. 2. The advantage of longitudinal compactness is retained, moreover the weight is well distributed between the front and rear axle. It, however, has the disadvantage of placing considerable more weight on the front axle.

In making the illustrations, the writer has taken pains to have the wheel base (i. e., center of front wheel to center of rear wheel), and the length of the loading platform equal in all illustrations, so that a good idea can be obtained as to the relative over-all length and weight distribution.

In conclusion, it can readily be seen that in the point of over-all length, the construction which embodies placing the driver's cab over the motor has the advantage of requiring less length than the other two types. While, on the other hand, the question may be asked, are the advantages to be gained by placing the driver's cab over the motor great enough to outweigh those claimed for the other constructions?

The general advantage of either construction presents itself when the conditions of operation are considered. The vehicle may be operated in districts where traffic is congested, which would favor class two, while on the other hand, accessibility may be the chief point to be considered, which then would favor class one. While both may be desired, therefore class three would be chosen. In the smaller vehicles class one is greatly desired, owing to its pleasing appearance when fitted with panel body.

From the above it can readily be understood that the construction of a vehicle is somewhat dependent upon the conditions of operation and nature of the work it has to accomplish.

TRUCKS DEMONSTRATE SUPERIORITY OVER HORSES

Last May the Department of Public Works of Detroit installed two five-ton G. M. C. dump trucks for hauling asphalt. This was done for the purpose of comparing the work of the horse-drawn vehicles, which had always been used in this service, and the newer method of hauling by motor trucks. The motor trucks have proved so conclusively that they are able to do better and cheaper work that the Public Works Department purchased the machines last week and will now use them permanently in road building.

The big trucks are used for hauling asphalt from the city asphalt plant to various paving jobs. At present the trucks are hauling from the city plant at Eighteenth Street and Michigan Avenue, to the corner of Palmer and Second Avenues, a distance of some two and one-half miles. Nine loads are hauled per day, five tons to the load, and the trucks cover in a day an average of forty-five miles. The cost of operating each truck per day is $7.50.

The greater work capacity of the motor trucks is well illustrated by one incident in a day's work. The horses and wagons report at the asphalt plant at 3 o'clock in the morning and leave at 4. The motor trucks, however, do not report until 6.30 and leave at 7.10. The motor trucks, however, reach their first stop before the horse wagons are ready to leave on their return trip. This, in spite of the fact that the wagons leave the plant three hours earlier. Not only do the motor trucks make three times as many trips per day as the horses, but twice as much tonnage is carried on each load.

Police Commissioner Rhinelander Waldo, of New York City, in the report of the police department, announced the fact that the three Garford trucks in their service had saved to the department $19,000 during the year 1912.

An automobile passenger line has been started between Chillicothe and Bainbridge, O., with two large sightseeing cars capable of carrying twenty passengers.

Steel Wheels Versus Wood

Views of a Steel-Wheel Maker

By W. E. FARRELL

PAST steel truck wheels have been much discussed in the trade and much has been written for and against their use since the first car of the year. Interest in them was renewed by a test witnessed by several engineers in which a cast steel wheel withstood the severest kind of abuse in an effort to destroy it.

The statement has been erroneously made that the use of cast steel for trucks is a result of an effort on the part of the manufacturers of small steel castings to find a further outlet for their product. In fact, the suggestion for their use came from the automobile engineer. Today their use is being advocated on the lighter trucks of 3 and even 2-tons capacity.

The truck engineer or designer on his trips abroad, found cast steel wheels replacing those of wood, or else he brought the sturdier design with him when he came to his new position in this country. We are only just beginning to follow in the wake of English and German practice.

It is to be regretted that our designers with a desire for the cast steel wheel did not in their own interest for the good of the industry determine the form and composition of their wheels after due consultation with the foundryman or metallurgist. In an effort to keep down the first cost too many were purchased on a competitive price basis, or made of unfavorable material by manufacturers not realizing the gravity or importance of the proposition.

This brought about occasional failures in service; mistakes are always magnified, and today for no well founded reason the cast steel wheel in the United States is being unjustly criticized. Many instances could be cited of users getting satisfactory service from trucks with cast steel wheels. As a typical instance, take a concern in one of our largest cities. This company has fifteen trucks in constant use, and after years of experience state that they would not purchase a truck that did not have cast steel wheels, that wooden wheels wear in the felloes, and that wooden wheels have to be rebuilt or the spokes renewed.

The objection raised by those opposed to the adoption of the cast steel wheel for financial reasons, or theorists giving sway to their imagination, are briefly stated as follows:

1. Their use is ancient. An opponent even going so far as to state that steel wheels were in use in 1858, when the Open Hearth process of making steel was unknown and the Bessemer process only discovered two years before in 1856.

2. Manufacturers using them have occasionally failed.

3. Some imported trucks have wooden wheels.

4. Manufacturers of trucks who use steel wheels have not previously used wooden wheels.

5. Steel castings may have hidden defects.

6. Their rigidity is objectionable.

7. They are non-resilient.

8. They are not able to withstand variations in temperature.

9. They are heavier.

10. They cost more than wooden wheels.

The second, third and fourth objections are altogether too flimsy to merit attention.

The fifth objection is true microscopically of anything made by God or man, unless it be a rainbow. Steel castings are subject to hidden defects the same as any other material, be it a steel forging with a seam or an ingot with segregation. What matters the possibility of a minute hidden defect in a steel wheel, when one with visible defects can be distorted beyond the semblance of a wheel, when made of the proper material and properly heat treated, so great is its strength beyond what could ever be required of it in actual service? Practice alone makes perfect; it only requires that cast steel wheels be purchased from a foundry with experience and the knowledge "how" to minimize this possibility of hidden defects so as to render such an objection of no consequence.

As to the sixth objection, are they any more rigid than a properly built wooden wheel? When a wooden wheel ceases to be rigid it will soon need repairs or replacement. Ninety nine per cent. of the flexibility of either the wooden or cast steel wheel lies in its tires.

Seventh. "Steel wheels are not as resilient as wooden wheels." The originator of this objection was not familiar with mechanics. Perhaps he meant something else or merely liked the sound of the word and used it to conjure by.

Eighth. Whoever heard that steel could not withstand climatic variations in temperature? Would any engineer use a different factor of safety for steel, wrought or cast, because it was to be used in Mexico instead of Maine?

Ninth. In considering the ninth objection, facts can be adduced to prove either side of the case that one may lean towards. It is undoubtedly true, however, that for 5-ton trucks and over, a set of cast steel wheels is much the lighter; for 3-ton trucks about the same, and for trucks of 2-ton capacity cast steel wheels may, with more experience, be made as light as those of wood.

Tenth. As to the tenth objection, "Increased cost of cast steel wheels," they can be and are made today at figures competitive with wooden wheels in the case of the heavier trucks. If the demand increases and they are ordered in larger quantities from foundries capable of furnishing finished wheels, the cost of cast steel wheels for the heavier trucks will decrease, and even for lighter trucks of 2 and 3-ton capacity, they can be supplied at attractive prices.

As has been noted, the objections offered to the adoption of the cast steel wheels are more imaginary than real, and none of them are really structural objections or objections which cannot be overcome. Such is not true, however, in the case of some of the objections to wooden wheels.

1. The brake drum cannot be made integral.

2. Weakness, especially under side strain.

3. Outside tire unsupported.

4. Difficulty in securing them to meet S. A. E. standards or tolerances.

Number one is self evident, for the brake drum must of necessity be made of metal.

As to objection number two, the wooden wheel in design is of necessity more or less a matter of experiment as to strength. No engineer could calculate the strength of eighteen or more different pieces of wood bolted or glued or pressed together, and the whole held in place by a metal band or felloe shrunk on to a greater or less degree, and secured at the center by bolts to a flange and a hub of a casting or forging. The best wooden wheels must of necessity be made by those firms having the most experience, the best force of experts to select the best lumber from the forests at their command. There is a vast difference in the quality of wood, and even of the same kinds of lumber, and this in turn is affected by the quality and the degree of drying. From the very nature of its design, the spokes can offer little or no resistance to a side thrust caused by skidding or striking a curb. This is a test that can be made in a laboratory and therefore is easy to prove.

Objection number three is, of course, self-evident on examining the rear wheels of any truck, and means that the spokes will in time loosen in the felloe and the structure eventually break down.

The fourth objection is really one of serious moment. Every truck manufacturer realizes the necessity for standards in construction and especially in

workmanship. The efforts of the Truck Wheels Standards Committee to get wheels with a reasonable degree of accuracy in finish is well known. Tires or rims are often not properly shrunk on, even the present very liberal tolerances in this particular are not so easy for the wooden wheel manufacturers to meet.

Both large 'bus companies in London have altogether abandoned the use of wooden wheels and cast steel wheels are now standard equipment of two of the largest truck manufacturers in the United States.

All question as to the more or less theoretical problem of relative heat conduction or radiation may be waived.

The issue as to the relative tire service given by either type, time can only prove in this country, though no such tire service is offered the user of wooden wheels in this country as is guaranteed to the London 'buses with steel wheels. A distinction not being granted in favor of wood in this country is at least favorable to the cast steel wheel.

The cast steel wheel meets all requirements as to accuracy of workmanship, concentricity, permanency of form, with great excess of strength to meet stresses from all directions. The facilities and ability to produce them are immediately available.

The truck will foster habits of promptness, thoroughness and decision

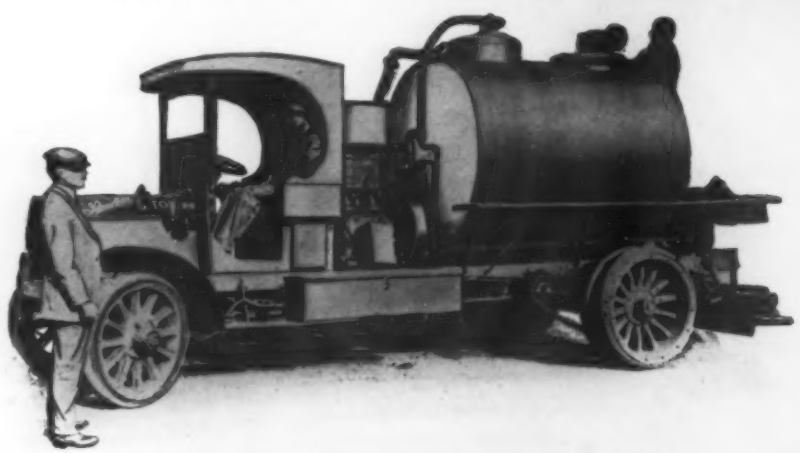
PEERLESS TRUCK PROVES ITS EFFICIENCY IN SPREADING OIL AT A HIGH TEMPERATURE

To spread oil on roads for a distance of 20 miles or more from the starting point and to spread it at a heat of 200 deg. or more would seem to be an extremely difficult undertaking requiring a lot of apparatus and a lot of men. But by the ingenious use of a Peerless five-ton truck the road commissioners of Los Angeles County, Cal., accomplish it with one man and one piece of mechanism.

The truck is fitted with a 1,000 gal. oil tank, which is covered with a coating of asbestos 2 in. thick to retain heat. Oil is run into the tank 350 deg. Fahrenheit. Thanks to the asbestos protection and the speed the truck can make, it is possible to make a trip of 35 to 40 miles before the oil gets too cold for use.

Air pressure of 60 lbs. to the sq. in. is maintained inside by an air compressor.

Heat from the motor exhaust is used to keep the oil spreader warm so that the stuff will not thicken and clog up there. The truck travels 50 miles a day and the driver says that in 2,000 miles only two involuntary stops were necessary on the road—both caused by dirty gasoline stopping up the fuel line.



Peerless Five-Ton Truck Used in Spreading Road Oil

TRUCK REPLACES THREE WAGONS IN DAIRY SERVICE

James Wass & Son, milk dealers, of Buffalo, N. Y., who have until recently used horses entirely in their delivery work, have changed to motor equipment by the installation of the Lippard-Stewart truck here shown, the body of which is especially designed for milk distributing purposes.

The carrying space is 98 in. long, 43 in. wide, 58½ in. high and enclosed by panel sides. The rear opening is fitted with drop tail gate and lift cover, while side openings are provided immediately back of the seat to allow easy access to the load from the running boards. The floor is covered with galvanized iron and is equipped with drip pipes and drain slats.

The Wass firm has replaced three one-horse wagons by the Lippard-Stewart and has been able to dispense with the services of one man. Every day the car makes 230 stops and delivers to 305 customers, doing this work in 5¼ hours. Gasoline consumption averages 10 miles to the gallon with the motor running continuously. Where, under the old method of delivery, the greater part of the morning was taken up on the route, the drivers are now able to complete their work by 8 o'clock, starting at the customary time of 2.30 A. M.

Shrontz Brothers, Washington, Pa., and M. R. Phillips, Troy, N. Y., dairymen, are using similar trucks for this kind of work.

A Lippard-Stewart With Specially Fitted Body in Dairy Service

RECENT WHITE TRUCK SALES

The White Company, of Cleveland, O., reported a recent sale of nine trucks to the Atlantic Refining Company, and of twenty 1500 lb. capacity trucks to the Post Office Department.

Commercial Cars for Mine Use

By C. L. EDHOLM

THE problem that confronts the mine operator in the use of commercial cars is somewhat more complicated than that faced by the owner of motor trucks in or near the cities. One of the first considerations he has to figure closely is the loss of time caused by breakage and repairs, and this is complicated by the fact that being far from the nearest agency, he has to wait a number of weeks to secure extra parts. This suggests in the first place a policy of keeping in stock a liberal number of those extra parts most liable to wear or breakage, such as tires, springs, etc. A reasonably well equipped machine shop in charge of a mechanic who understands motor cars is another essential for first class and regular service. As a matter of economy, it is also desirable to find the truck best fitted for his purposes, and have his fleet of commercial vehicles uniform, thus making it easy to keep a stock of interchangeable extra parts on hand.

Showing the rugged character of the country and the stiff grades which have to be negotiated

Severe Conditions

The conditions about the average western mine are as severe as the motor truck is required to face anywhere, ranging from long sandy stretches over the desert or through washes with occasional treacherous fords, to the heavy grades and abrupt turns of the winding mountain roads. This calls for considerable flexibility of speed, as too low gear will cause unnecessary delay on the stretches of good road, while the standard gear ratios seem to be too high for the grades of 14 per cent. and more often encountered in the mountains.

The experience of the Calumet and Copper Creek Mining Company in Arizona, affords some very practical suggestions, as that mine has been served by motor trucks for about a year and hauled ores, concentrates and supplies over roads of every character.

About the first discovery made by the Calumet and Copper Creek managers was that rubber tires would not do. The road from Winkleman, the nearest railway station to the mine, is about thirty miles long, of which about twenty miles is over sand or dirt roads in the San Pedro River bottom, while the remaining ten is over hard packed mesa land and steep mountain grades. The sand did not affect the solid rubber to any great extent, but the mountain roads

Top illustration shows one of the Moreland trucks, with special dumping body, used in mining service. The center illustration shows the traction engine and train, which displaced the burro train. The bottom view shows the trucks loading from an overhead hopper.

with their rock foundation and a sprinkling of sharp, flinty debris on the surface simply chewed up the rubber tires at a ruinous rate. The fact that the double wheels in the rear did not follow the ruts, but projected into the rough and unbeaten portion of the road, resulted in large chunks of rubber being gouged out. This difficulty was overcome by the substitution of wood blocks set with the end of the grain to the road. They were slightly cheaper, considerably more durable and became more resilient with use. This resulted from the wear on the blocks forming a mass of coarse bristle, which absorbed a certain amount of shock. The manager states that about six hundred miles of rocky road is the average life of such tires.

Shock Absorbers Saved Springs

The next difficulty encountered was spring breakage. Although the trucks were not overloaded, the road conditions were so severe that a great deal of time was lost in replacing broken springs or waiting for their delivery by freight. The chuck holes in the river road would let down the load suddenly and the rebound would snap the spring with distressing frequency. This was partly obviated by additional care on the part of the drivers, who were instructed to learn the bad places on the road, but the final solution of spring trouble was the addition of spiral shock absorbers of heavy weight.

Burro Train, which used to be the only means of carrying the ore from the mines

Standard Gear Ratios Too High

Another difficulty was obviated by the company in securing better service over the heavy grades. It was found that the standard gear ratios were too high for the best results, and one of the trucks, which admitted of the change was thereupon equipped with a nine tooth sprocket wheel, replacing the fourteen tooth sprocket.

The other cars, which were of different make, were so constructed that the change could not be made. This lowering of the gear ratio helped wonderfully in the car that was changed, adding greatly to its efficiency.

A Suggestion

In connection with the problem of getting the load over the mountainous section of the road, it would seem feasible to modify the method used by the company in doing heavy teaming, and adapt it to commercial car conditions. The use of heavy truck or tractor and a string of trailers would be advantageous in making the long haul from the railroad through the valley to the hills. At the bottom of the grade, the trailers could be uncoupled and taken over the mountain road one at a time, effecting considerable economy.

Dumping Bodies and Ore Chutes

The fleet of three five-ton trucks, two Morelands and one Packard, have been used at Copper Creek mainly for transporting the ores from the various shaft mouths to the company's mill. This is all short haul work, as the average round trip is about four miles, but as this is in the heart of the mountains, it is all over heavy grades and winding roads. Six round trips daily is the schedule for each truck. Only one man is required to a car, the driver doing both the loading and unloading. This is easily accomplished, as the ore discharges from the mine bin into the body of the truck, while at the mill the self-dumping body shoots the load into the mill bin with the minimum expenditure of time and labor.

Owing to the recent completion of a steam road between the mill and the shaft, the motor trucks will not be used for the short haul work hereafter, but will transport concentrates to the shipping point, thirty miles distant, and on the return trip will carry camp supplies and machinery to Copper Creek.

Distillate and Gasoline

An interesting feature of the Copper Creek Company's test of the motor truck is the comparison of fuels. Two of the cars burn distillate, using a patent gasifier, while one burns gasoline. The results indicate that though the gasoline costs a little more and is supposed to deliver somewhat less power, it is in reality a trifle cheaper, as less gasoline was required to do the work.

The cost is estimated at 10 cents per ton mile, allowing for all charges, fuel, lubricating, oil, repairs, loss of time and depreciation. Of course the conditions are exceptionally severe in the Arizona mountains, and transportation of every sort comes high. As the Copper Creek people have made use of every method for ore hauling while developing the mine, from burro trains and twelve-horse teams to steam railroads, their endorsement of the motor truck is of value as it is the result of experience

The economy in time and labor is a most important factor in a business in which the pay roll is the main expense. A feature like the self-dumping body, which eliminates shovel work, appeals strongly to the mine owner, therefore, as it means one or more pay checks saved, and labor comes high in the southwest. Feed of horses, that is another item that runs into money very fast in the desert, and when for any reason the work slackens and the teams are idle, the expense of keeping them turns profit into loss at a rapid rate. The fact that an idle motor truck consumes nothing is a big advantage in a business that has periods of activity and depression, with consequent overwork and idleness.

Trucks Used at Cooper Creek Mines

In the upper left is shown one of the trucks discharging ore at the mill. Note the large dumping body. Below it is another truck which has just come up the grade shown in the right of the photo. In the upper right is a five-ton White truck, climbing a stiff grade to the mine; below it is a close view of a truck discharging, by means of a dumping body, a load of five tons in one minute; and in the center is a view of the railroad which was built on a road formerly used by trucks.

DETROIT DEPARTMENT STORE HAS FREE MOTOR 'BUS LINE

An innovation in progressive department store management has been started by the Elliott-Taylor-Woolfenden Company, of Detroit, which has established a free motor 'bus line from the Campus Martius, the main traffic center of the city, to the store, half a mile distant, for the benefit of its patrons. Round trips are made on a fifteen-minute schedule during shopping hours.

The vehicle consists of a Packard two-ton truck chassis equipped with a special 'bus body. Two rows of seats with a center passageway provides accommodations for twenty-two persons. The interior finish is mahogany with dark green leather upholstered seats. The special equipment includes interior electric lights and cushion tires.

Alfred Gaynor has recently installed on his express route between Worcester and Spencer, Mass., a new two-ton Universal truck with which he is able to make two trips to and from Worcester in five hours or less, while with horses it was an all-day job. He is disposing of seven horses which he formerly had in his service.

Noteworthy performances of trucks are becoming more and more common. However, the recent run of two 1-ton Kelly trucks of Hersum & Company, of Boston, between that city and New York and return, heavily loaded with furniture should be mentioned. The distance one way is 242 miles, the run being made in 22 hours and 50 minutes, on the return unloaded the truck averaged 12.7 m. p. h., as against 10.6 loaded. The gasoline consumption of the two trucks showed an average of 10.8 miles to the gallon, and 96.8 miles per quart of lubricating oil.

For Appearance Sake Only

By LEN G. SHAW

JAMES VERDON, president of the company bearing his name, and maker of a popular soft drink, waved his hand majestically, as though in this manner to dismiss the subject under discussion.

"It is no use spending any more of your time or mine talking about trucks," he declared, indicating plainly that so far as he was concerned the interview was over.

Tom Reed's teeth came together with a snap. His lower jaw squared itself determinedly. And if Verdon had not at the instant turned his attention to other matters he would have detected an ominous gleam in the gray eyes that had been watching his every movement.

Reed's wrath was not without cause. In the days when he was handling electrics he had sought to interest Verdon in that means of delivery, only to fail, through no fault of his own. Whatever the argument advanced, Verdon invariably wound up by declaring that he could make deliveries more cheaply with horses, and he refused to be budged from this ground.

For months Reed had been after him on a gasoline truck proposition, and always the discussion swung around to the question of cost, with Verdon confident as ever regarding what he could do.

Reed's patience was about exhausted, but he belonged to that class to whom every rebuff brings added determination, and he decided to keep trying. So, smothering the impulse to flare up, in an instant he was a paragon of outward composure.

"You say you can do your deliveries cheaper with horses?" he inquired, with well-feigned innocence, as though he had not been hearing that statement at frequent intervals for months.

Verdon fell headlong into the trap.

"Certainly," he declared. "You see there's only about seven months in the year when we are real busy. I can buy all the horses I want in the spring, use them all summer, and sell them at a profit in the fall."

"Do you mean at an actual advance over what they cost you?" persisted Reed.

"Well, no, not exactly that," explained Verdon. "Of course we can't get all our money back. We don't expect to. But it cuts off the cost of having to keep them all winter, doing nothing but eat their heads off, and the expense of having a couple of hostlers caring for them when they're not bringing anything in. That's what I mean by a profit."

"Did you ever stop to consider how much it costs to keep a motor truck when it is not running?" asked Reed, quick to take advantage of the opening afforded.

Verdon's shoulders were elevated a bit, and the surprise he displayed was not affected.

"No. Why should I?"

"Don't you know that the moment a truck stops running the expense of maintenance ceases—that if you had a fleet of trucks, when your season was over you could run them into the stables you now own, and that they wouldn't cost you a penny in the way of maintenance until you used them again. Besides, they'd always be ready in an emergency, and at this time of the year you wouldn't have to go outside and hire trucks because you hadn't any horses. What is more, I'll wager you never counted the time and labor involved in getting a supply of horses in the spring and selling them in the fall as a legitimate charge against your delivery cost, have you?"

Verdon admitted the correctness of the surmise.

"And yet you go poking along with an antiquated delivery system, fooling yourself into the belief that it is cheaper"

"But why should I charge it up to delivery?" he argued, lamely.

"Why shouldn't you?" countered Reed. "It's an expense that belongs there."

Verdon made a few marks on a sheet of paper.

"Maybe you're right," he admitted, as the light began to break. "But even at that it is cheaper, and horses are always available."

Reed's eyes twinkled, and the corners of his mouth raised in a half smile.

"Do you remember the third of last July?" he inquired.

Verdon essayed a laugh, but it was mirthless. On that never to be forgotten day, with holiday demands to be met, every horse but one in the Verdon stables succumbed to the terrific heat and was rendered useless. It was the same all over the city. Teams were out of the question. In desperation Verdon had called up Reed and implored him to assist in the work, offering any price rather than disappoint his customers. Reed had furnished three trucks, and every delivery was made on schedule time. Ever since then reference to that occasion had been carefully avoided by Verdon. Now he grinned sheepishly.

"Of course, that was an exception," continued Reed. "I'll admit that you can make your deliveries with horses. And so you can walk down from the house every morning, and home at night—but you don't. When you go out to call on the trade you can travel afoot—but you don't. You have just bought a runabout so your collector will not spend three-fourths of his time riding in street cars to reach the people who owe you money. When you go up to see Walters at his office you can climb the stairs to the twelfth floor—but you don't, because your time is too valuable. You dash into the express elevator, and grumble because it doesn't travel any faster. And yet you go poking along with an antiquated delivery system, fooling yourself into the belief that it is cheaper. If you had a man in your employ who wasn't any more progressive than that, you'd fire him on the instant—and he wouldn't blame you. Good day."

And slipping on his overcoat, Reed took his departure.

* * * *

A week passed. Then one day the telephone rang. Verdon was at the other end of the line.

"Do you know," he began, "I've been thinking over that hot shot you fired at me the other day. You hit my pride when you poked fun at our delivery system."

"I wasn't poking fun at it," protested Reed. "I was never more in earnest in my life. I just wanted to show you where you were losing money"—

"Never mind the question of expense," interrupted Verdon. "I still insist that we can do it cheaper the present way. But I've figured it out that we can use three trucks just as soon as the weather begins to warm up—for appearance sake, you know, for they do look more progressive. Supposing you drop in this afternoon and we'll talk over what we need."

"I'll be there at 2 o'clock," said Reed. He smiled as he hung up the receiver.

"For appearance sake only," he chuckled. "He's bound to save his face somehow."

Heavy Commercial Car Bodies

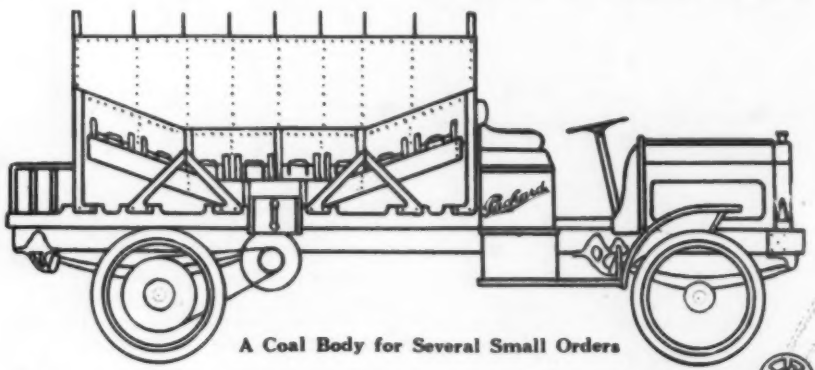
The body here depicted is made of steel throughout and can be used for eight separate coal deliveries of 1000 lbs. each, for one delivery of 8000 lbs., or in any proportion. Each compartment is made to hold 1000 lbs. of stove coal, figured on a basis of 35 cu. ft. to a ton of 2000 lbs., and can be discharged separately.

The size of body is governed by commodity carried. If used for coal, size is based on 35 cu. ft. to the ton of 2000 lbs., and if used for sand or crushed stone, size is based on 20 cu. ft. to the ton. The rear of body is made wider than front, thereby facilitating discharge of load. The hoist is made of cast standards, holding in place a train of cast steel gears. The upper pinion meshes into cast steel racks at each side of body. The body when elevated has a pitch of 45 degrees. It requires from 2 to 2½ minutes to elevate body to its maximum height.

These bodies are used for carrying coal, lumber and general merchandise. Many are in use carrying merchandise one way, and coal on the return trip.

If used for lumber, loose rollers are placed on the floor, and when body is elevated, lumber is discharged immediately. If used for case goods of any great weight, body can be elevated, which will lower rear end to level of platform, forming a continuous skid.

When used for carrying brick, the end gate is made higher than sides, and is hinged from the lower edge, and when unloading, end gate is placed on a level with floor, forming a complete chute, eliminating the possibility of breaking brick, as end gate will almost touch ground. The bodies are shipped without chassis, ready to apply, which can be done in about two hours. These bodies are manufactured by the Monahan Vehicle Company, Providence, R. I.

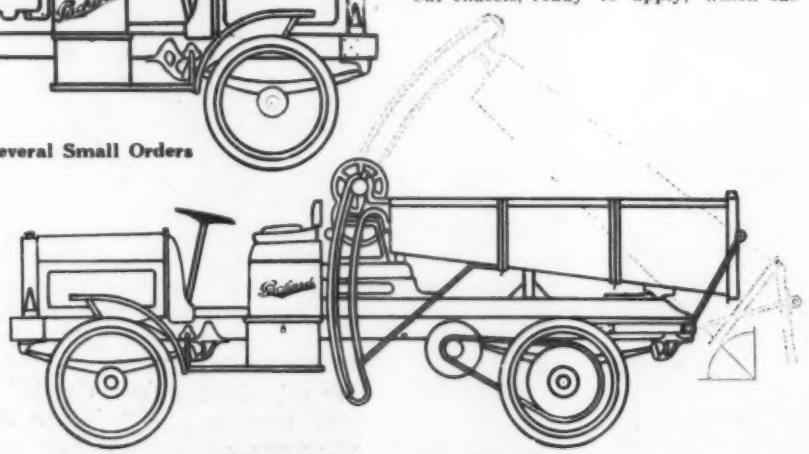


A Coal Body for Several Small Orders

This body is intended for small orders, and allows a driver to mix his load with different kinds of coal, and discharge each kind at his will. In loading the truck separate weighing is not necessary, owing to each compartment being made exact size. In loading, if compartments are leveled at top each compartment will hold a uniform weight.

The body is made of No. 10 sheet steel. The sides are reinforced by T-angles, made continuous with forged corners, and riveted on 2½ in. centers. The end gate is made full size of rear of body, and telescopes side angles, to prevent leakage of material in transport. The end gate is hinged two ways.

If body is used for coal, garbage, sand or stone only, end gate is hinged from upper corner. If body is used for general merchandise, end gate is hinged from lower corner, and suspended on chains.



A Body for Three or Five-Ton Trucks

The Sparks-Withington Company, of Jackson, Mich., is using 50 per cent. kerosene and 50 per cent. gasoline to operate its Packard auto truck, using a regular gasoline carburetor.

The truck will enable the mediocre man to accomplish more than others of much greater ability

The British Commercial Car Show

AS a show the British Exhibition of commercial cars, held last month at Olympia in London, was a distinct success, but as a business proposition it is always difficult to gauge such an event accurately, because much of the effects resulting therefrom are not seen until weeks or months have elapsed. Yet compared with the last exhibition of a similar kind held at the same place five years ago, it certainly offers a vast improvement, and in the intervening time the business man has been educated to the possibilities of the utility automobile, so that visitors on this occasion have attended with a much better idea of what they want to find out and possibly to buy.

As a reflection of the development of the national industry, the display may be regarded as fairly representative, and in addition there is a good sprinkling of exhibits from other countries, especially from France and Germany—doubtless owing to the open market of a free-trade country.

Leading Influences in Design

In reviewing the exhibits a comparison with the Commercial Vehicle Show of 1908 is inevitable, and there are certain broad tendencies which particularly strike the attention in the present display.

The most important of these is certainly the decreased weight of the chassis, especially in the three-ton and heavier classes. This is largely owing to the evolution of the motor omnibus in London, which under later police regulations has been forced to adopt a lighter form of construction to bring the total unladen weight of the complete vehicle with body, within the limit of 3½ tons (British), or 7784 lbs. In the majority of this class, therefore, there is a tendency to adopt a lighter form of frame and consequently a more flexible form of transmission, while for the same reason there is a very marked increase in the number of live axles. This lightening tendency, too, has of course made itself felt in the heavier sizes up to five-ton loads.

And among these bigger machines another important influence is seen in the subsidy types which exemplify the bearing that military requirements is having on design. As already recorded in these pages, the British military authorities have specified on broad lines their requirements for 1½ and 3-ton vehicles, which, if built to comply, are eligible for a substantial subsidy on the owner agreeing to sell to the War Office at a price fixed up on an agreed rate of depreciation—on a 15 per cent. per annum basis. As a matter of fact, so stringent are the army requirements that the 1½ and 3-ton subsidy types are fully capable of dealing with two and four-ton loads respectively on average European roads.

The similarity of these military requirements with those of countries where the road system is comparatively undeveloped is fully realized, and in view of the attention that the possibilities of the commercial car are attracting in the more out-of-the-way parts of the British Empire, the subsidy class seems likely to develop the design along rather standardized lines. There were many colonial visitors at Olympia and with them these types attracted much attention.

Private Car Influence

Among the light delivery vans there was little particular development to notice. In the main, their evolution is very much following that of the private owner's vehicle. So too are the light carriers, and the little four-wheelers are tending to encroach on the domain in which the three-wheeler has hitherto been paramount.

Neglect of Quick Loading Possibilities

It is curious how little the user of commercial cars in Europe has realized the possibilities of the quickly detachable and interchangeable body, which is far more advanced in development on your side of the water. Indeed, there were none shown and even the tipping wagons were of a fairly ordinary type if one excludes a steam truck using a trunnioned hydraulic tipping gear.

Handy Units and the User

To the user who has to maintain his machines in running condition, but has not the advantage of a workshop equipped with lifting tackle, the design of the main units such as gear box, back axle casing, and so forth, is of considerable importance; and in this matter the compact and comparatively light parts of certain of the big machines on view stood out well, especially the De Dion, on which it cannot be said that the dimensions have been cut down at the expense of wearing surface, for few, if

Three-Ton Covered Van by the Maudslay Motor Company
The engine of this is one of the most accessible known, with overhead cam shaft, which can be slung clear of the cylinders

any, stand up better under hard wear than the example mentioned. This is a point upon which the present tendency towards greater lightness of construction may yet have an important bearing in the future.

General Details

A good deal more attention is being given to load distribution, and in this matter great advances have been made since the last show. Frames, too, are narrower. Mostly the longitudinals are quite straight, for experience has shown that in commercial work the greatest stress comes near where they are inswept for the steering lock, and from the same experience the channels of pressed steel frames, instead of being deepest midway between their points of support, are often made deepest just level with the clutch and gear box.

Engines and Their Details

While the mercantile car engine has exercised an important influence on the private car in improved methods of lubrication, in some other points the position has been reversed. The vehicles at Olympia, in general, certainly have longer strokes than they used to, although the stroke-bore ratio is nothing like as great as in general car practice.

The waterproof magneto too is coming more into use, and in one of these, the Mea, the field magnetos are made to swing with the spark timing mechanism so that the maximum spark is obtainable at all timings.

The multi-jet carburetor, too, is finding increased adoption; indeed one design, the Maudslay, had twelve jets and gives exceedingly economical results. In this detail, too, the importance of maintaining the fuel level as constant as possible is most essential, and some carburetor manufacturers for this reason are operating the needle valves through longer levers so that the valve is less affected by vibrations.

Trend in Transmission

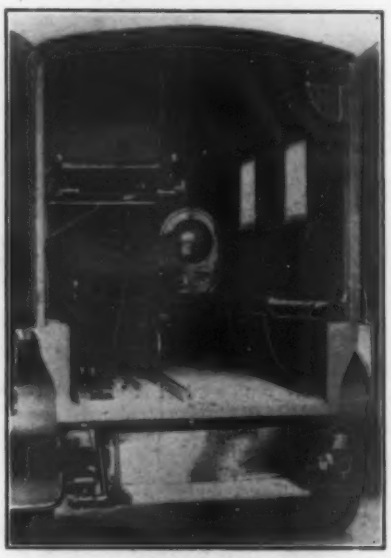
For clutch work, either the leather cone or the multiple plate clutch is general. Cork inserts are hardly used at all over here, only one example—on the Scout heavy chassis—was in evidence. It is a little remarkable how the cork insert has been neglected in Europe.

Owing to the rule of the road in Great Britain, the driver sits to the right side, and hitherto the gear change as well as the hand brake have been placed to his right. Now, however, a good many designers are placing the gear change half way along the front seat so that it can be worked by his left hand. This is certainly an improvement as far as vehicles with side wind doors are concerned; and in any case it leaves him more hand room for his levers, while there is less possibility of mistake on the part of an inexperienced driver.

Steam driven motors of various sorts are much used in Great Britain and practically all these have an arrangement for locking the differential, so that the full adhesion of both wheels is available, if there is any tendency for them to slip. Hitherto designers of gasoline driven machines have rather neglected this point, but among those on view there were one or two examples in which it was adopted. On one of them the differential could be locked from the driver's seat where exceedingly steep or slippery ground is to be traversed. There is no doubt of the value of the locked differential; it has been well proved in practice.

A Clever Front Drive

An unconventional type of body was the Mass tractor, which embodied one of the cleverest applications yet brought out of front drive. In this, the engine was in the usual position, transmitting power in the regulation way to a gear box and counter shaft behind it. This counter shaft, however, lying transversely across the frame, was much shorter than usual, so that the chain sprockets at its ends lay inside the frame longitudinals. From them chains were brought forward to chain wheels driving bevel pinions above the front axle, and these bevel pinions meshed with others on shafts passing through the stub axle pivots, and carrying at their lower ends other bevel pinions driving bevel gear rings secured to the front wheel so that their driving contact was in a position practically unaffected by the turning of the road wheels in steering.



Interior of the Wolseley Ambulance

The stretchers can be raised or lowered at will and are loaded in by wheeling up the grooved rails seen lying on the floor.

Central Pivot Steering

One of the most noticeable tendencies in the show lay in the increasing adoption of a form of steering with the axis of the stub axle dead over the tread of the wheel. Leyland, Daimler and Austin were examples in point. In most this was effected by placing the pin inside a hollow hub, but in the last named, on a 2-ton chassis, the same result was got by dishing outwardly the spokes of the cast steel wheels so as to bring the stub pivot into the required position, and making the hub project inwardly across the pivot, so that the hub cap was inside. The result of this was a flush faced wheel, which would tend to glance off anything with which it came into contact.

An Unconventional Design

This chassis was full of original points. To begin with the ventilation of the bonnet was the reverse of usual practice, for the radiator was against the dash, and air was drawn in forwards, from the direction of the driver's seat, by a fan, whence it was induced downwards by the partial vacuum that the car tends to make underneath itself when running, and it was claimed, this air filling up the vacuum tends to keep down the dust. The machine, however, has already been described in these pages, and we need only point out the purpose of the double bevel drive is to afford the advantages of both live and fixed axle, while the spring suspension at the back, necessitated by the low loading platform, certainly tends greatly towards lateral strength and stability.

Notes on Wheels, Brakes and Springs

Cast wheels were very much in evidence, and indeed on the bigger vehicles the built-up wooden wheel was quite the exception, while even on some of the quite small vans the steel wheels were used.

Although American designers, I believe, almost invariably apply all their braking to the back wheels, engineers in Europe maintain that on slippery pavement one cannot obtain the same freedom from side-slips with hub brakes.

Chassis of the Big Six-Cylinder 120 h.p. "Commer" Car Fire Engine

This machine is fitted with a rotary pump capable of delivering 850 gallons a minute against a pressure of 120 pounds to the square inch

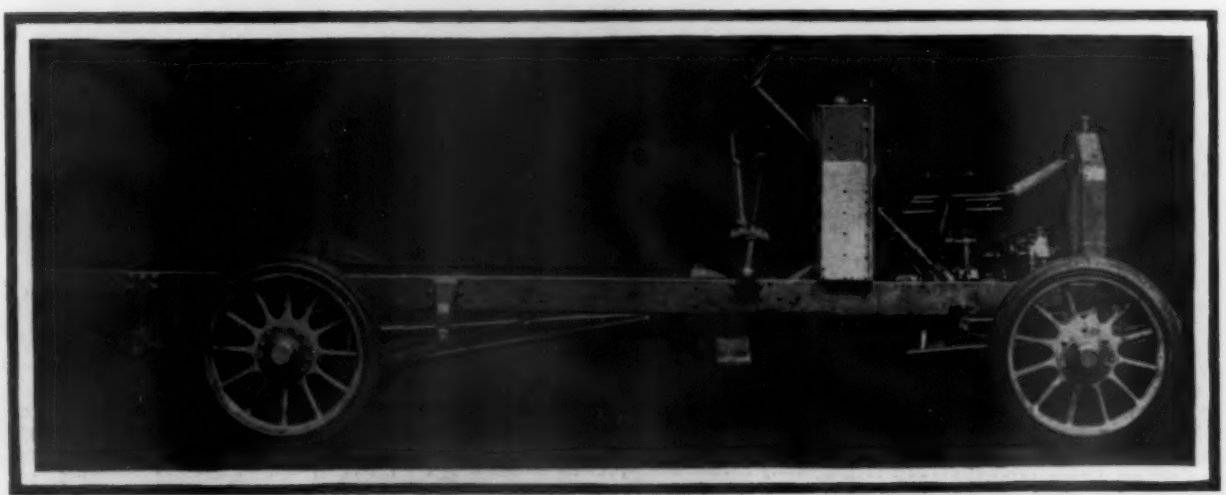
however well compensated, as when the braking effect is transmitted through the differential. Usually, therefore, the foot brake is on one of the gear box shafts, but in one (the Siddeley Deasy, which is a worm driven live axle type) the worm shaft is extended at the back, and on it the brake drum is secured behind the back axle. This, too, is an arrangement coming into use on private cars.

In tires there was nothing very new, but more attention is being given to tread sections.

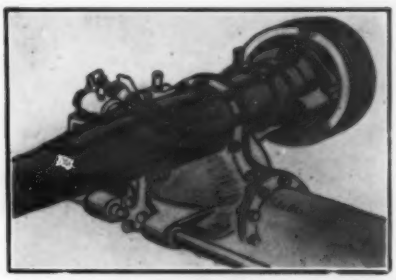
When one comes to consider the wide variation in load on the springs in a commercial car, it is fairly obvious that either the springs are right for full load, or are rough in traveling when the vehicle is running light or with part load. In either case, the machine tends to knock itself about unduly under one of these sets of conditions, and this is a point that has curiously enough received remarkably little attention, probably on account of manufacturing costs. There were at Olympia, however, one or two methods of dealing with the matter. One of the Leyland vehicles was fitted with a small subsidiary plate spring, so that as the load deflected the main spring, it gradually brought the frame down on to the second spring. A similar principle was adopted on the Daimler, only in this case the secondary spring was volute, a form which lends itself to graduated action. Perhaps, however, the simplest solution was seen in the Carey springs, which are practically ordinary plate springs, but with the plates arranged in three or more groups, the top of each group at their ends being given less camber, so that there is a space between their ends and the under surfaces of the plate next above. The top group is the largest, and when this has deflected up to a point, it comes down on to the ends of the second group, while the same principle finally brings the third group into action. It is questionable though, whether the tread section

A Three-Ton Thornycroft
This truck was built to qualify for the British War Office Subsidy of $5500; the body is also built to conform to the British Army requirements

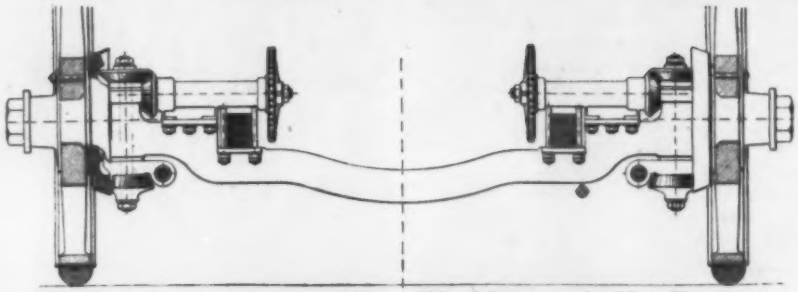
The Latest English Daimler Production
The 1000 lb. van with 15 h. p. Knight slide-valve engine. The gear box in this is incorporated with the back axle casing



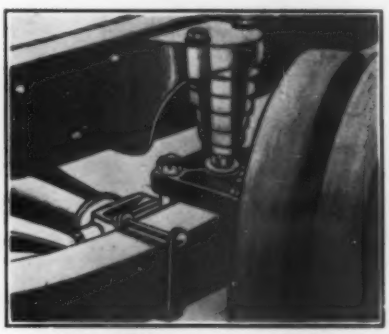
A Wolseley C. C. Type Chassis
One of these was exhibited in London, fitted with an ambulance body. The engine is $3\frac{9}{16}$ in. bore, and $4\frac{1}{2}$ in. stroke



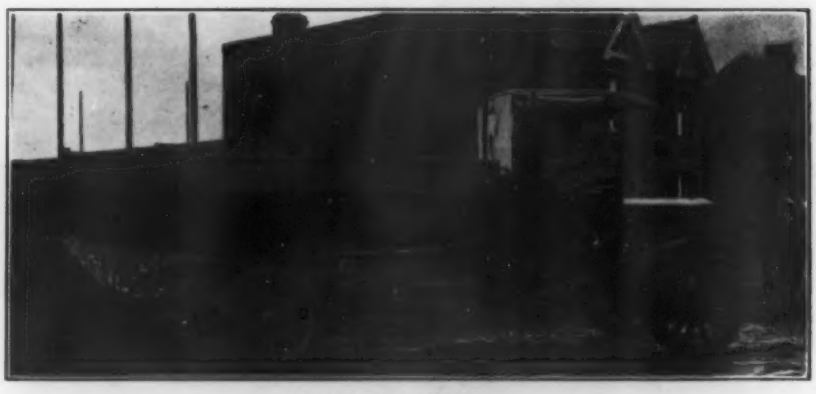
Foot Brake on Worm Driving Shaft
Arrangement of Siddeley-Deasy foot brake on tail of worm driving shaft



The Ingenious Arrangement of Front-Wheel Drive on the Mass Tractor
The sprockets on the inner side of the shaft are driven from off the countershaft, as mentioned in the text



A New Type Auxiliary Spring
Volute coil spring on the Daimler



A Six-Ton Tipping Wagon
Exhibited by Commercial Cars, Ltd., at Olympia. The tipping gear is worked by the engine

Tipping Gear in Operation
Showing the engine-actuated tipping gear on the six-ton Commer truck being put into operation

A Four-Ton Commer Van Supplied to Lever Brothers, the Noted Soap Makers
This is the forty-first of this make ordered by Levers, and one of a repeat order for fourteen

of front wheels may not to some extent be influenced by the increasing introduction of the central pivot steering system already noted, for past experience rather points to the semi-circular tread for this purpose. When the wheels are directed through the ordinary Ackerman steering, they tend to roll in a circle round the steering pivot, but with the central pivot they practically turn on a point at the center of their own tread, and with flat tires this may set up undue wear. At any rate the writer knows of one case in which the central pivot was abandoned for this reason when used in conjunction with flat solid steel tires.

Lighting and the Future

Lamp manufacturers over here are more and more being driven to the conclusion that for the rough work of the utility automobile, specially strong lamps are necessary. Many of the best known makers are bringing out special models for this purpose, while some manufacturers make nothing else. Most of those shown were either oil or acetylene, but many of the oil lamps were convertible to electric, and there are many signs that electric lighting will be extensively used, especially for the passenger vehicles. There were many good examples of various electric lighting systems on view. Indeed one 4½-ton truck chassis, the Pagefield, was fitted with a special platform for carrying a dynamo.

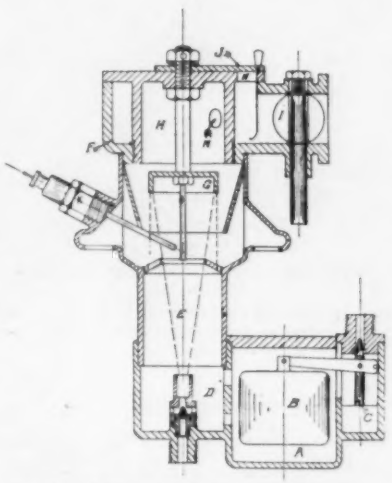
Starting From Cold On Heavy Fuel

LAST month, by the courtesy of Commercial Cars, Ltd., a representative of this Journal was enabled to witness at their works in England, a demonstration of yet another device for enabling kerosene to be used on automobile engines, and by embodying, as it does, a new principle, and offering the advantage of starting on kerosene from cold, it affords certain points of peculiar interest.

The Details of Design

To appreciate these points, it is necessary to understand the principles involved, and these are best realized from a description of the appliance. Briefly, the apparatus consists of three main parts, the pressure valve, the filter, and the producer proper. Referring to the accompanying section of the producer, the flow of kerosene or heavy oil to the float chamber A is controlled by the action of the float B on the needle valve C, and fuel is maintained in float and jet chambers (D) at a level just above the top of the jet. The union at the bottom of the jet chamber is connected by a pipe with the pressure valve, which in turn is connected with the compression chamber of one of the engine cylinders, so that when the crank shaft is turned, that compression blows the fuel upwards in a spray (indicated by dotted lines at E), the angle of which is decided by the orifice in the slightly conical diaphragm half way up the producer. Only 7 to 10 lbs. to the sq. in. is necessary for this, however, so only the early part of the compression is used. Its action is regulated by the pressure valve, which is of the floating double ended type normally held on a seating at the cylinder end by a coil spring. Under sufficient cylinder compression the valve is opened against this spring, but when the compression rises sufficiently it forces the valve (against spring pressure) on to its seating at the producer end and so automatically cuts off compression pressure from the jet. The air supplied to mix with this fuel spray coming in through the openings in the pockets above the slightly conical diaphragm on each side, is controlled automatically by simple flap valves, and just at the point of mixture the end of a long insulated electrode from an otherwise ordinary sparking plug K, by the turning of the engine crank, is made to pass a spark to the prolongation of the spindle on which the bevel plate G is fixed—this serving as the earth electrode. The result is that the mixture is ignited and passes upwards in a flame at high velocity through the hole M into the jacket F surrounding the chamber H. Now this hole is near the throttle, but close against it in the jacket is a partition so that the charge has to pass at high velocity right around chamber H before reaching the throttle I.

Although the charge is already ignited, it is a mixture in which fuel is strongly in excess, so that the flame is comparatively cool. Just before entering the throttle chamber, however, additional air is added through the orifice N, the aperture of which is controlled by a slide J.



Sectional View of the Radical Kerosene Carburetor Described by Our Foreign Correspondent

This carburetor ignites the mixture before it gets to the explosion chamber

Explanation of an Anomaly

It is important to emphasize this excess mixture, for therein lies almost the essence of the invention. It might be quite reasonably expected that this premature burning of one's charge would lead to loss of heat, and so efficiency in the engine. Yet though this undoubtedly is so to some extent, the amount of this loss is nothing like as great as would be imagined. Indeed, after a severe hill climb, the writer found the wall of the jacket part at F by no means as hot as the metal of an ordinary air cooled cylinder, the explanation apparently being that the heat is taken up in vaporizing the charge, much of it going into latent heat. Even supposing the loss was considerably greater than appears, it might still be worth paying the price to obtain proper vaporization, and freedom from sooted cylinder surfaces and constant cleaning. And that the cost of such advantages is not abnormally high, seems evidenced by the result of various tests, which are stated as averaging 49.5 ton miles to the gal.

For starting the slide is kept closed, but once the engine is running and warmed, it is usually kept full open without any necessity of varying to running conditions.

At the demonstration the writer witnessed, the producer was taken off one car and put on a 2-ton lorry chassis loaded with 2 tons, making a total weight of 9,184 lbs. and run up a long hill, with ruling gradients, ranging from 1 in 8.5 to 1 in 7, without any trouble or undue heating, but perhaps the most striking point about it was the ease of engine starting. There is no more difficulty in starting from cold than with an ordinary gasoline engine. Two turns of the cranking engine never failed, and when started up, or running steadily, the exhaust was perfectly clear. It was only when the engine was raced that any smoke was visible, and as far as could be seen, this was chiefly due to lubricating oil. It is true there was some suggestion of kerosene smell, but certainly not enough to amount to a nuisance. The opening of the diaphragm and diameter of the baffle plate have to be suited to the engine to which the producer is fitted, but the difference here is very small, varying by thirty-seconds of an inch for the diaphragm, and sixteenths for the baffle.

Although the producer in its present mechanical stage represents some four years' work, it is only at the beginning of its commercial life, which, judging by the possibilities it has shown, should be considerably successful. Already, we understand there are one or two vehicles fitted with it on the western side of the Atlantic, in Canada.

COMMERCIAL CARS REPLACE STRIKERS

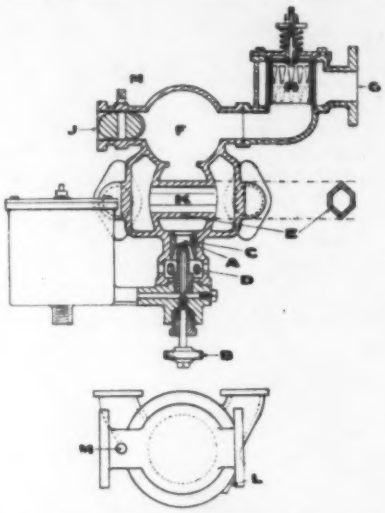
A good example of the influence of the commercial car on labor difficulties has recently been afforded at Bradford, in Yorkshire, England, where the carters went out on a strike which lasted for four days with a good deal of rioting and violence. Bradford is a center of the textile industries, and during those four days, the bigger firms involved by the strike purchased no less than fifty automobile trucks, with the result that the further services of a good many of the strikers are no longer required. At the time of writing this is promising to lead to further trouble.

Although physical conditions in Great Britain, and to a lesser degree other countries of Europe, are against the production of electric current as cheaply as seems possible in America, and consequently, electrics have not received the attention in Europe that they have in America, there are signs that they are likely to attract more attention in the future, and considerable interest is being shown in them. Indeed

in certain branches of transport work there is a prospect of extensive adoption of the electric car, especially by municipal bodies who own their own power generating stations.

THE LATEST FOREIGN KEROSENE CARBURETOR

The first particulars of this carburetor are just to hand. Its principles of working and broad features are best seen from the accompanying section. A float of the usual type is used to regulate the supply of fuel to the jet (A), which is rendered variable by a needle regulated by a screw with a fine adjustment effected by the driver at will through the action of a toothed quadrant on the toothed wheel B. The diameter of the choke tube C is such that the air drawn through it has to travel at a very high velocity, inducing the kerosene spray from the jet so that the mixture strikes the bridge K, through which the exhaust gases are passed from the jacket surrounding the carburetor. The section of this bridge (shown at E) is such as to break up the spray, as well as afford vaporizing surface. To avoid condensation hot air is drawn into the mixing chamber F from a heat collector surrounding the exhaust pipe, the supply being automatically regulated by the registration of V-shaped ports in the valve H, which afford a means of very fine adjustment. Thence it passes via the throttle J to the engine. Apart from the fact that there are practically no moving parts to get out of order, this carburetor is claimed to be adaptable to any engine, the only part having to be adjusted to individual requirements being the variable jet; but this once set is capable of allowing a definite range of variation for each particular engine, and remains constant for that amount of variation.



Sectional View of the Notax Kerosene Carburetor

Reference to the letters will be found in the text. The lower illustration shows the arrangement for fitting drop pipes.

WHEEL ALIGNMENT INFLUENCES TIRE BILL

The important influence of correct wheel alignment was recently brought to the writer's knowledge in the shape of an Armstrong-Whitworth 3 ton truck, which had been run for over 16,000 miles with very little apparent effect to the tires, which were Polacks. Apparently, the driver made a great point of paying attention to this matter, and had made special gages, which he frequently applied for testing the wheel alignment. Judging by the results he had attained it would certainly be worth while for every user to supply wheel gages for the garage, and to see that the wheels are kept in due alignment. Few owners realize the amount of money that is being paid on the tire bill, merely for wheels out of line with each other.

DAHL INNER-TIRE CUSHIONS

The solution of the pneumatic tire question is now solved, according to the Dahl Punctureless Tire Company, of 1309 Race Street, Philadelphia. This company maintains a manufacturing plant, and is selling an inner cushion which takes the place not only of the inner tube, but of the air. It is not a tire filler, nor any substance which is heated up and pumped in hot, but is a specially prepared compound which is mixed cold, and comes in lengths of 18 and 20 in., covered with a woven cotton fabric, somewhat similar to a stocking. This material, it is claimed, does not disintegrate, or deteriorate with the action of heat or cold, and so far as the company's experience extends it does not wear out with use. The oldest tires now running have been on the road some eighteen months, and from examination show that the material is apparently just the same as when put into the tire, and good for an indefinite period to come. The writer himself knows of several truck users who are using with the greatest satisfaction the Dahl Inner-Tire Cushions.

Special tools are used for inserting the sections in the tire, and these sections are then compressed until the tire takes its normal form, and is under the same pressure it would be if pumped up to carry the loads intended. Smaller sections of the inner-tire are inserted until the pressure is correct. After a tire has been run for a couple of weeks, say four or five hundred miles, without change of any kind the company recompress the cushions, inserting a sufficient section to offset the slightest loss of pressure due to the cushions shaping themselves to the inside of the tires. After this no further attention or expense of any kind is necessary.

When the tires are worn out the same inner cushion can be put into new tires and used indefinitely. The claim is also made that tires do not wear out as quickly when the inner-tire cushions are used as when filled with air, because the casings are always under the same tension, and are never run soft.

The chief advantage of this material for commercial cars using pneumatics is the entire absence of delays due to tire troubles, such as rim cuts, blowouts, punctures, etc. The only thing that can happen and which can of course always happen to any tire, is damage by a bad cut. In this case a Martel Vise Boot which this company handles can be clamped upon the injured shoe, preventing dirt from working in, thus protecting both the inner cushions and the shoe until the tire can be vulcanized.

Up to recently it was necessary to go to the Dahl Punctureless Tire Company to have the cushions inserted, which was done without charge, but a set of tools in three different sizes has now been perfected which will be sent to purchasers who live in distant places so that they can insert the inner cushions themselves.

The makers assume the manufacturer's guarantee on tires, and will make adjustment of any shortage of mileage on any make of casing equipped. So sure are they of giving satisfaction that they offer to refund the price if after the end of thirty days the outfit is not satisfactory.

The prices range from $55 for a set of four wheels of 28 by 3 in. up to $145 for a set of four wheels of 37 by 5½ in. These prices are f. o. b. Philadelphia, inner cushions properly inserted in the tires. The material is guaranteed for one year, although as previously stated, eighteen months' use causes no apparent deterioration.

A Shipment of Six-Ton Packards

These trucks are the six-ton unit, a recent addition to the line of heavy-duty vehicles put out by the Packard Motor Car Company. They were shipped recently to branches of the Ogilvie Flour Mills Company, at Toronto, Fort William and Winnipeg, Canada.

Druggists' Trade Increased by Motor Delivery

THE wholesale druggists and the manufacturing chemists are large users of trucks, hauling from railroad to manufacturing plants, and from there to the retail stores. One of the last lines of trade that might be expected to use commercial cars is the retail druggist, who has, of course, no use for a heavy truck. A few have found motorcycle delivery to be very helpful and satisfactory. Others are using the small Ford with delivery body, while still others employ vehicles up to one ton capacity.

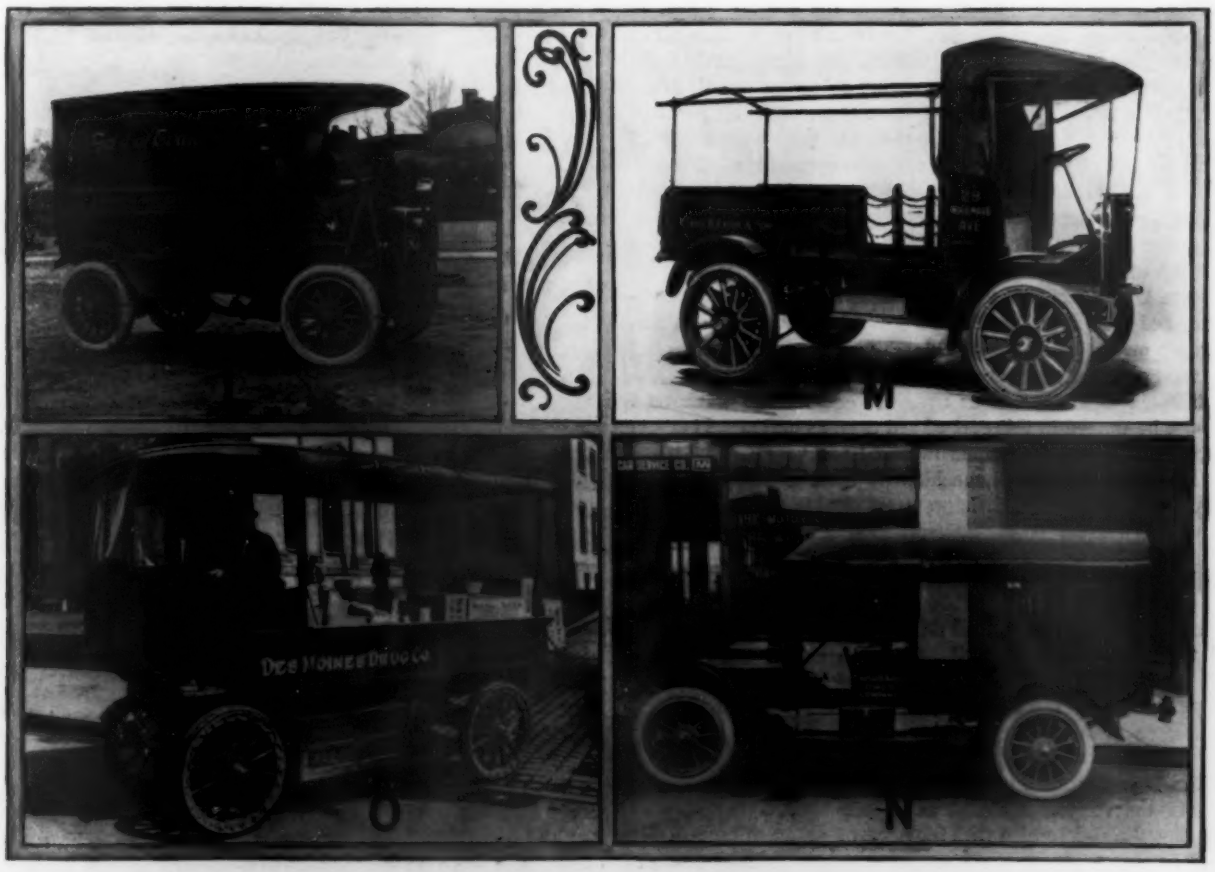
The Yahr & Lange Drug Company, of Milwaukee, Wis., well-known truck users, state as follows:

"We have used automobiles for delivery service the past three years, and have found them very much more satisfactory than the old method of delivering by horses. At that time our men were compelled to work from 9 in the morning until 9 or 10 o'clock in the evening, and had considerable complaints from our druggists as to the slow delivery of merchandise. With the automobiles, especially of late, with the new improvements which have been made the past three years, we have overcome all these complaints as our goods have been delivered between the hours of 9 A. M. and 6 or 7 P. M. In fact, we have delivered a great many more goods as our business has increased the past three years."

The Churchill Drug Company, of Cedar Rapids, Ia., use a Detroit electric for local city delivery. This little car does the work of two horse-drawn wagons.

The electric was chosen as they could keep it in the warehouse and round the store without affecting the insurance rates. The body was built specially and permits loading and unloading in narrow alleys. The operating expenses, including tires, current, body repairs and painting average about $51 per month. They are making in the neighborhood of 38 to 42 miles per day on an average.

The Theodore Eaton Company are handling heavy chemicals with the same make of electric. This machine is taking the place of three one-horse wagons. According to the manager, in two years' operation the cost has been about equal to the complete cost of one horse-drawn outfit. The driver cares for the car himself. The garage expense is nil as the car is



Vehicles Used by Retail Druggists

The cars here shown are used by retail drug houses, and show the various types of bodies best suited for this work. The letters indicate as follows: L. An Autocar used by Evans, of Philadelphia. M. A Detroit Electric used by Eaton-Clark Company, of Detroit, capacity 1½ tons, speed eleven miles per hour. N. White truck used by the Lemar & Rankin Drug Company, of Atlanta, Ga., capacity 1500 lbs., operated on pneumatic tires. O. Baker Electric of one ton capacity, in service of the Des Moines Drug Company, of Des Moines, Ia.

kept in a part of their building. The only expense has been a set of tires once a year and a mechanical overhauling and repainting once since it has been in service. The body is covered with sheet metal in shape of a pan so as to protect the mechanism in case any of the carboys of acid handled should break.

The Louis K. Liggett Company, of Buffalo and New York City, is another large user of trucks, having both Autocars and Lippard-Stewarts in their delivery system. One of these Lippard-Stewarts takes care of all the requirements in the five stores in Buffalo, while the other one operates in New York.

Evans, of Philadelphia, Using Trucks

Although as before stated, very few retail druggists are using an automobile delivery service, a few of the more progressive have already found that modern delivery methods pay. Prominently among these may be mentioned the Geo. B. Evans drug stores of Philadelphia. This company was one of the first to realize the advantages of the use of trucks, and five Fords and one Autocar are now employed; in fact, a point is made in their advertising of the use of these trucks, and phone orders to be delivered by truck are solicited. On this particular point, Mr. Evans, in a conversation with a COMMERCIAL CAR JOURNAL representative, particularly brought out the advantages of this system. He said, "Very few realize the decided advantages of establishing sales by telephone, the trucks making it possible to deliver in the shortest time. A telephone clerk can easily care for from three to four times as many sales in a day by telephone as such a clerk could wait upon in person. People ordering by phone usually make up their mind beforehand approximately what they want, and if it is only a toothbrush, they are very apt to say, 'I want a twenty-five cent toothbrush, or a certain kind of toothbrush,' and the clerk is thus saved a great deal of time that would be consumed if they were present waiting for them to make up their mind, and handling over numerous small articles on the counter before deciding. There is another feature which amounts to considerable in a large retail business, and that is the fact that there is less loss owing to dishonesty on the part of the employes when goods are delivered by the trucks, as there are always slips regarding the transaction, while for minor sales over the counter too much time cannot be wasted in this sort of red tape, as customers become impatient when the amounts involved are very small. Thus with small sales there is considerably more chance of a large house losing through dishonesty of clerks when the goods are not delivered."

Trucks Rented With Drivers

The Geo. B. Evans stores do not own or operate their trucks, but these are rented for a fixed sum of ten hours a day from the Gibbons-Wetherill Service Company, Mr. Gibbons being a pioneer in the rental of trucks to merchants, or rather the rental of truck service, as the business houses using this system have no care or responsibility whatever of the vehicles, although same may be painted and decorated with the name of their company. If for any reason a truck breaks down and deliveries are delayed, a telephone message brings either an emergency wagon or a duplicate machine to handle the goods. If ten hours service are not given, there is a proportional reduction in the charge. The trucks can be ordered to begin work at any time, and end at any time, a charge being also made for overtime. The Evans stores have a boy on each of these vehicles to assist the driver. These boys deliver the goods to the houses. As a rule, however, the drivers are in charge, and even make collections, turning the money in upon their return.

The suburban residents of Philadelphia have been educated to expect delivery. Very few now carry any parcels, and the practice of sending goods by the local train to be cared for by the station agent has, on account of motor truck delivery, been almost discontinued, and the people now expect goods to be delivered direct to their homes. The advertising value of these vehicles with the "Get it at Evans" upon them is appreciated by the company, and they know that much business has come through this means. Occasionally a customer asks to have something delivered, and the clerk may say, "I don't know whether we deliver there." Invariably the answer comes, "Oh, yes you do, I have seen your automobiles out there."

When asked as to his reasons for putting on commercial cars, George Evans said, "We had to do it to keep up with the procession. Through their use we have gradually increased our business, and I firmly believe that if we had not put them in service we would have lost much of the business that we already had." When asked as to the advantages of such a rental proposition as compared to owning trucks, Mr. Evans seemed to think that for a beginner it was a very good thing. For instance he said, "We would not have known at the beginning that we did not need anything larger than a Ford, and if trucks had been purchased would probably have bought a much more expensive equipment than we really required. We also knew nothing about trucks, in fact none of our employes were very familiar with them, and we had no facilities for taking care of them. Now we are relieved of all these duties, and the cost, although it might seem high, as it runs approximately ten cents a package, is in reality not so, owing to the other advantages."

The automobile delivery service extends in all directions from the Evans stores at the center of the city, within a circle of forty to forty-five miles diameter, taking in all the important suburbs. The Gibbons-Wetherill Service Company also has extra machines which can be had at a moment's notice during rush season, so that the vehicles already in service do not have to run overtime during such periods. Taking all together, Mr. Evans is highly pleased with the delivery service, and with the use of commercial cars for his retail drug stores.

Detroit Electric Fleet of the Palais Royal Store, of Washington, D. C.
The first six are one thousand pounds capacity each, the next three are two thousand pounds and the last is three thousand pounds

MOTOR TRUCK A PRIVATE HOTEL

U. H. Dandurand, president of the Comet Motor Company, of Montreal, owns a Packard three-ton truck which is fitted with a unique body resembling in appointment a miniature hotel. There are sleeping accommodations for ten persons, a telephone system, electric lights, a kitchenette and a combination smoking and dining room, in fact, all the comforts of home are included. This body was designed by the owner's son, Lieutenant Henri Dandurand, of the Sixty-fifth Regiment, C. M. R., of Canada. The body has five separate compartments. Immediately behind the driver's seat are quarters for the chauffeur. Next comes a room with sleeping accommodations for five women, another compartment, 6 ft. square, being used as a combination smoking and dining room. This room has berths for four. It is equipped with two extension tables, each 3 ft. long by 19 in. wide and a folding desk. To the rear of this compartment is the kitchenette, which includes a linen cupboard, a unique gasoline stove and a refrigerator.

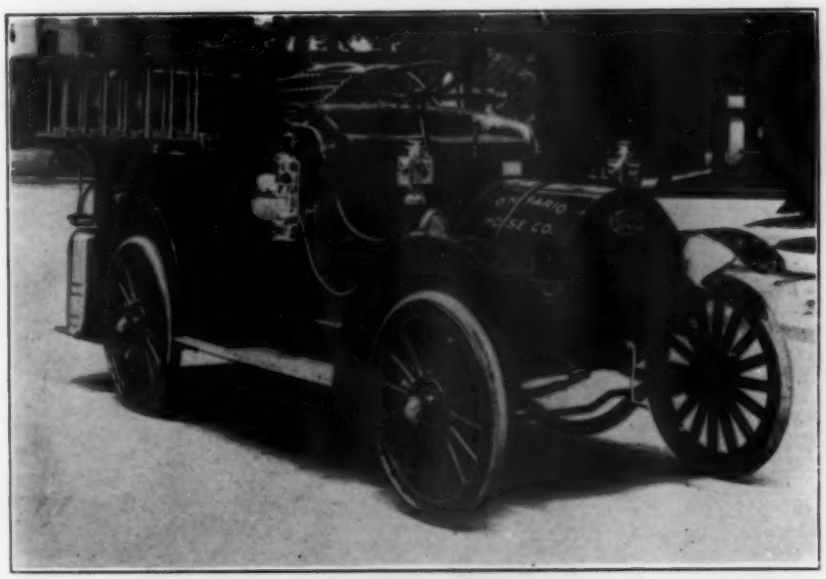
The Mills Oil Company, of Syracuse, N. Y., is using a novel tank wagon for hauling oils. The tank is divided into two compartments, each holding 140 gal., and with its pillow blocks is removable, mounted upon the flat deck of a Palmer-Moore truck. Two cans at the rear of the tank hold 5 gal. each, while a 10-gal. tank is placed at the front for the driver, this giving a total capacity of 300 gal.

The Great Western Automobile Company, Peru, Ind., will soon enter the commercial car field. According to report its designs are being made by the Taylor-Neuteboom Company, Detroit.

First of the New Alco Trucks Which Will Carry the United States Mail in New York City. The Fleet Will Consist of Eighty Trucks

NOVEL MOTOR 'BUSES USED AT PLEASURE RESORT

The Grove Park Inn, at Asheville, N. C., is using two large 50 h. p. Packard cars for transferring passengers and baggage between the railroad station to the inn on the slope of Sunset Mountain, a distance of four miles. The 'buses are designed along the lines of cars used in Paris. The machines are 16 ft. long by 7 ft. wide, with entrance on right side, immediately in the rear of the driver's seat. The 'buses are double-deckers, a stairway leading to the top on the inside of the body. The capacity is twenty-two on the inside and twelve on top. The chairs in the 'bus are not fastened and may be moved at will by the passengers. The inside of the cars are upholstered in solid leather and are lighted by electricity. The 'buses are provided with couplings for hauling rubber tired trailers loaded with baggage, extra trailers being provided so that a 'bus may drop an empty trailer at the inner station and couple immediately to a loaded one.



Chase One-Ton Hose Wagon
Built by the Chase Motor Truck Company, of Syracuse, N. Y., for the Ontario Hose Company, of Canandaigua, N. Y.

FACTORY DEPARTMENT HEADS ORGANIZE

At the Willys Motor Truck Works, in Lima, O., heads of the departments have formed a social organization, known as the Willys-Overland Club, Lima Division. Twenty-seven members joined the organization during the first meeting recently held at the Elks' Club. Superintendent Conroy was elected president.

Chicago Garage Owners' Association and Electric Vehicle Association of America held its field day on July 25. The affair was very successful and about two hundred and fifty people were present.

In the afternoon the Garage Owners' Association was defeated in baseball by the Electric Vehicle Association. After that the usual athletic sports were held.

The prizes included oil tanks, ignition batteries, half-page ads. in trade papers, etc.

R. R. Herchelroth, of Johnstown, Pa., possesses a number of patents on trucks and motor fire apparatus, and is organizing a company to manufacture vehicles according to his patents. He has secured an option on a factory site located in the Oakhurst district of Johnstown. Mr. Herchelroth has been in the employ of the Carnegie Steel Company for twelve years.

The National Motor Truck Manufacturing Company is building a new factory at Gibsonburg, Mich. The company announces that $100,000 of its authorized $250,000 capital has been subscribed.

S. A. E. MISQUOTED IN NEWSPAPER ITEMS

It is reported in a newspaper item which evidently had wide circulation, that the Society of Automobile Engineers after various tests on red second growth hickory, found it better for automobile wheels than the white variety. This is contrary to the truth of the matter. The S. A. E. merely commented on a report of the U. S. Department of Agriculture on tests of vehicle and implement woods. In this report it is brought out from tests that no red hickory spokes are now allowed in the A and B grades, which are supposed to be the best, yet the government tests show that a large proportion of the red spokes now included in the lower grades should, because of their strength and resilience, be included in the highest grades.

This is a very different conclusion from that published in the daily press.

INCREASED MOTOR SERVICE FOR ENGLAND

A $730,000 company has been formed in England to install a motor 'bus service in and between the principal cities of the island, similar to the notably successful service of this kind in London. The new company proposes to start operations soon with vehicles supplied by the London General Omnibus Company, Limited, and to add to its fleet of omnibuses by new cars to be built in the same factory where London company's cars were constructed.

An Original Boring Mill for Continental Crank Cases

The necessity for accurate and speedy methods of boring crank-shaft, cam-shaft, pump-shaft and magneto-shaft bearings in the crank cases of Continental motors forced the Continental Motor Manufacturing Company to design this special boring mill. It operates four multiple spindles turning ten cutters, and completes this operation on each crank case in sixteen minutes. The crank case can be swung into position and reamers set ready for cutting in three minutes.

General Motors Company. Mayer J. H. Brandel, of Owosso, Mich., has prepared a letter to be sent to the officials of the General Motors Company, demanding that the amount of bonus given in consideration of the establishment of the business of the Reliance Motor Truck Company there several years ago be returned to the city. The company signed a 15-year contract with the city, the conditions of which have of course not been fulfilled, the Reliance company having been removed to Pontiac for consolidation with the Rapid Motor Truck Company. It cost the city of Owosso about $30,000 to get the factory, and it is felt by many that the city should act at once to compel the General Motors to indicate what its intentions are in regards to compensating the city for the loss of the Reliance plant

International Motor Company, Allentown, Pa., has received an order from H. J. Heintz Company, well-known manufacturers of food products, for one hundred Mack motor trucks.

The truck will increase your business and decrease your expenses

LOCOMOBILE COST SYSTEM FOR THE OPERATION OF FIVE-TON TRUCKS

This system is made up of two units; one, the driver's daily report and the other, a book in which this report is transcribed.

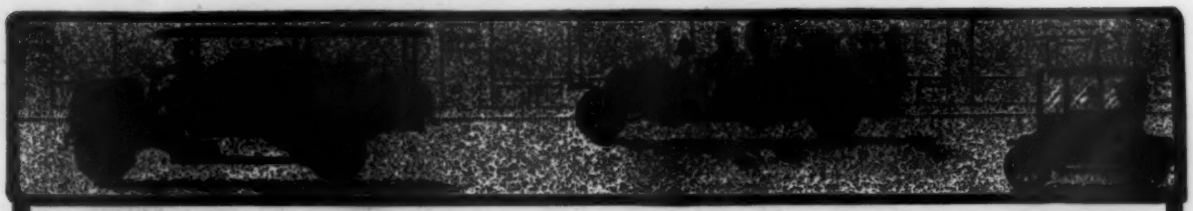
It takes about two minutes for the driver to make out his card at the end of each day's work. It takes just about three minutes for the truck foreman to transcribe this report into the book of cost records. Or, if more convenient, the cards may be allowed to accumulate until the end of the week, and transcribed into the cost record book in 10 or 15 minutes.

Under fixed charges are garage, $25 a month; driver at $20 a week; insurance at $190 a year, and interest, averaged yearly at 5 per cent., $125; making the total fixed charges per annum, $1655. Taking 300 days to the year, this brings the fixed charges to $5.50 per day.

The variable expenses are depreciation, tires, repairs, gasoline and oil. By taking the average performance of many trucks the expense for these items per mile has been determined at 20 cents.

Therefore in order to find the exact cost of operating a five-ton truck, simply take $5.50 as the fixed charge and add 20 cents for every mile the truck has traveled during the day.

Locomobile Record Cards



Motor Truck Efficiency

Hard Base, Channel type for heavy service.

Empson type —Metal and Hard Rubber Base—

The Firestone quality in tires—
The Firestone variety of types—
The Firestone Quick Removable Rims—
The Firestone sureness and sincerity in suiting the equipment to the special need—
These features make up the program for maximum efficiency of your trucks.

Firestone

Truck Tires and Rims

For Continuous Service at Lowest Cost

Cushion Electric for light service.

Notched Tread, Continuous Base Type, for Economy and Greatest Mileage in Heavy Service.

There is a Firestone tire for your trucks, your loads, roads and special service condition.

Notched tread, shown here, is unrivalled for mileage and truck protection in general service for heavy duty, particularly on rear wheels.

Your requirements may be best met by an entirely different type.

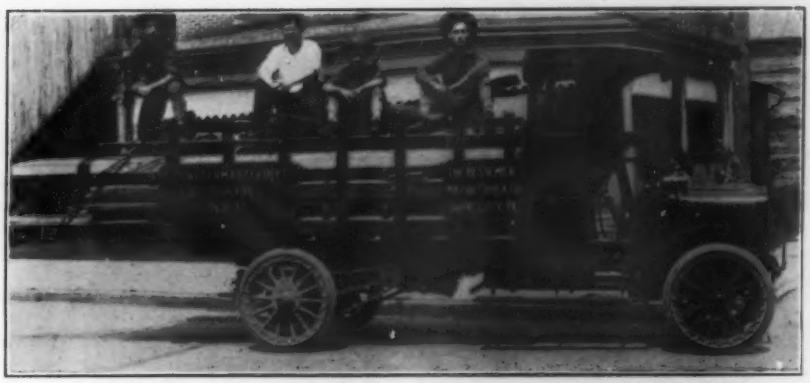
But in any case, you need Firestone Quick Removable Rims. No lay-ups for tire changes. Drivers do it easily in half an hour—no special tools.

Write for Truck Tire catalog. Then call a Firestone man from nearest Service Station and let him advise with you.

The Firestone Tire & Rubber Co.

"America's Largest Exclusive Tire and Rim Makers."

Akron, Ohio. All Large Cities.



One and a Half Ton Bessemer Truck Used by National Guard, at Erie, Pa.

This car carried the company equipment from Grove City to Erie, Pa., a distance of one hundred miles, in six and a half hours. During the ten-day encampment the truck ran 729 miles over soft ground, without any adjustment. Chains were used on the wheels the entire time.

WORM GEAR PATENT LITIGATION RUMORED

It is rumored that the General Electric Company has purchased the patents of E. Thomson and H. Lemp, granted August 30th, 1904, on a worm drive, and has sent notices to some of the trade that they are infringing its patent. It is stated, however, that there are several patents which ante-date those now controlled by the General Electric Company, among which is that of W. Scott, August 21, 1900, and the Lanchester English patent 13433, which dates back to 1897.

Worm drives have been in use for many years, and many in the trade are of the opinion that it would be hard to establish a patent on this form of drive, but it must be remembered that the General Electric Company is a concern which has had a great deal of experience in patent matters, and this concern could not afford to take a stand unless it was practically sure that it could hold its position.

Kelly motor trucks, made by the Kelly-Springfield Motor Truck Company, of Springfield, Ohio, won a decisive victory in the strenuous tests recently conducted by the Detroit Board of Education. The tests were held in connection with the selection of a one-ton truck for general hauling for the Board of Education. The tests were held over a 2½ mile stretch of sandy road. The road was fairly level with the exception of about 100 yards which was up a 7 per cent. grade. The sand was about six inches deep on the level, but nearly a foot deep on the grade. The Kelly covered the entire course without any trouble and was the only truck which went through the entire run without a stop.

The Motor Car Dealers' Association, of San Francisco, Cal., held its annual meeting on July 9 and elected the following officers for the ensuing year: J. A. Marsh, president; Chester M. Weaver, vice-president; R. K. Roberts, secretary; H. L. Quesney, treasurer, and W. W. Brackett, traffic manager.

EVELAND JOINS FORCES WITH THE MARTIN TRACTOR COMPANY

Samuel S. Eveland, of the Eveland Engineering & Manufacturing Company, Philadelphia, Pa., formerly with the Standard Roller Bearing Company, has become identified with the Martin Tractor Company, of Springfield, Mass., of which H. G. Fisk, President of the Fisk Rubber Company, is president. Mr. Eveland, who is the owner of the Hunter and other tractor truck patents covering tractors to be used in connection with the fire apparatus and other wagons and trucks, will turn all of his patents over to the Martin Tractor Company, which company now controls a number of patents on tractors.

A factory will be erected immediately for the manufacture of tractor trucks for the trade in addition to which the Knox Automobile Company, of Springfield, Mass., will continue to make them under a license agreement.

A Peruna Truck

The Peruna Company states: "As to the number of horses which our trucks have displaced, will say that our average is very high, one of our trucks doing practically the work which eight horses did before. Roughly estimating, we would say that our hauling expense will not exceed one-third of what it was when we used horses. We find a truck more satisfactory, in every respect, than horses."

PACKARD'S SUCCESSFUL QUARTER YEAR

The Packard Motor Car Company, of Detroit, Mich., reports that its sales of motor carriages and trucks during the last three months represent a value of $8,120,000. Its May shipments were the heaviest it ever had. Its June truck sales show an increase of $270,000 over the same month of last year.

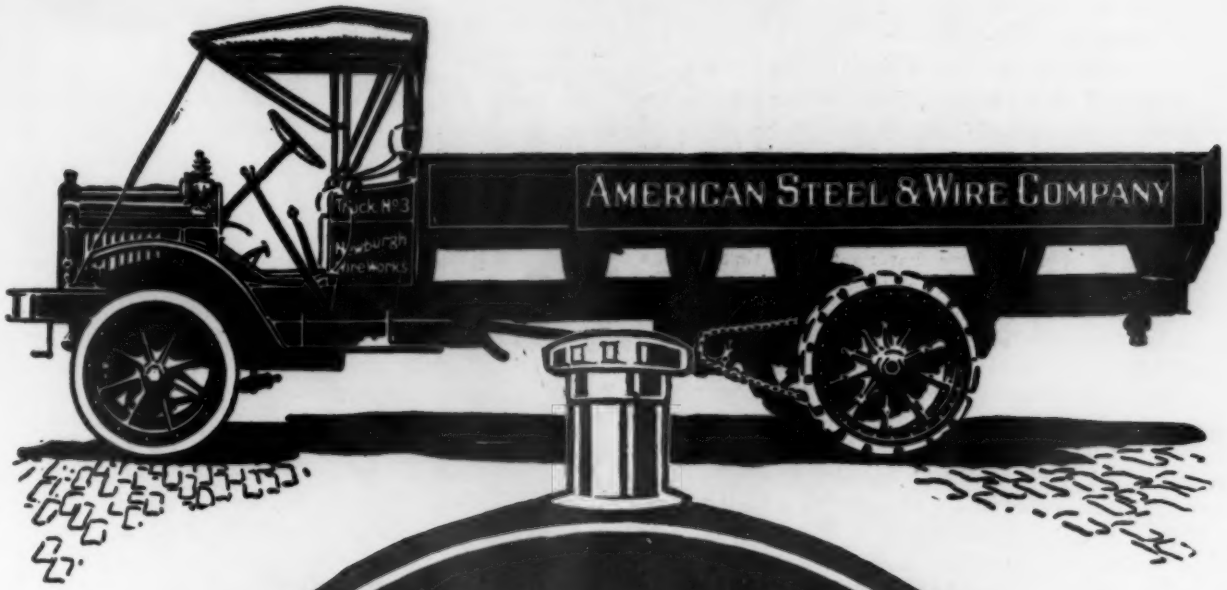
NEW HAMPSHIRE INCREASES TRUCK FEES

The last New Hampshire legislature increased the registration rates for commercial vehicles. The new rates are: one-ton $10; two-ton $12.50; five-ton $15, and over five ton $20.

WISCONSIN DEALERS ORGANIZE

The Northeast Wisconsin Automobile Association has been organized by automobile dealers in many of the cities. One purpose of the organization will be to better the roads.

The Detroit Lubricator Company will exhibit at the National Gas Engine Show at Kansas City, August 16th to the 23rd, a large stand showing several Detroit mechanical force feed oilers driven by a small electric motor pumping oil against several hundred pounds pressure. A large number of models of the Detroit mechanical force feed oiler will be shown for use on stationary and marine gas engines, gas tractors, commercial trucks, automobiles and aeroplanes. The Detroit Lubricator Company will also exhibit section models of the Stewart Carburetor.



Why Pay for Experience?

YOU can get the benefit of other concerns' experience for nothing. Most of the country's leading firms have studied the motor truck problem practically and carefully, by the use and thorough test of many makes of trucks. The fact that these companies are using White Trucks, and are every day ordering more, is YOUR motor truck answer.

Experiment if you must, but in the end you, as others have done, will use White Trucks. Profit by what others have discovered and use White Trucks in the beginning; saving time, worry and expense.

3500 White Trucks in Service Today

THE WHITE COMPANY
CLEVELAND

Manufacturers of Gasoline Motor Cars, Trucks and Taxicabs

ENABLES OWNERS TO KEEP TRUCKS BUSY

Goodyear Establishes Chain of Truck Service Stations

A chain of truck service stations has recently been established by The Goodyear Tire & Rubber Company, of Akron, Ohio. Truck garages and wheel shops have been established in all of the larger cities of the country, and many more are to be added from time to time.

The fact that tire change-overs often tie up trucks for a considerable length of time, has up to this time been a serious objection to the use of the motor truck. Some business men in adopting the commercial vehicle for their merchandising, have complained that they do not make the saving over horse haulage that they counted upon.

When traffic experts have analyzed these cases they have found in many instances, either that the truck was too large for the work that was provided for it, or that the business man had not shifted his trucking system from the horse basis when he put on a truck, and was losing full value of his motor equipment by reason of allowing it to stand idle a considerable part of the time.

In order to overcome this last objection, it is necessary to reorganize the system of maintenance, so that the truck will not be laid up for repairs. This difficulty, in the inauguration of motor trucks, was recognized by The Goodyear Tire & Rubber Company, and for that reason its chain of service stations has been established, so that hereafter truck owners will be enabled to keep their trucks busy all the time.

Day and night, the new Goodyear truck garages and wheel shops will be open, to render truck owners this service. A force of expert wheelwrights and mechanics, large enough to take care of any kind of work that may come in, will be on hand.

The opening of these service stations marks a wonderful stride in the advancement of motor truck industry, and is bound to stimulate the use of motor trucks.

Heretofore, when it was necessary to change over a wheel from old Standard to S. A. E. Standard, it was necessary to send the wheel to a wheelwright, resulting in delays, during which the truck was laid up. Frequently the work, when turned out, was found to have been done inaccurately, giving a promise of future trouble, both to the truck owner and tire man. Truck wheel change-overs were out of the usual line of the wheelwright's work, and as each wheel was an entirely different problem, it had to be worked out as such, and consequently valuable time was wasted by the tire company's representative having to personally direct practically every move the mechanic made.

To offset this condition and to allow truck owners to keep their trucks moving all the time, The Goodyear Tire & Rubber Company, with its spirit of progressiveness, determined to install these wheel shops in the larger cities where this work could be handled by men who were experts, with a constant minimum of delay and confusion.

These garages will have a place for storage, and no matter how difficult the change-over, a man can put his truck in the garage at night, and the work will be finished and the truck ready for business in the morning.

In connection with the garages will be a wheel shop and stock room. In the stock room will be stored everything necessary for repairing a truck, such as wheels, rim bands, bolts, fastenings, for every type of truck, and in fact everything that goes to make up the equipment of a perfect truck wheel plant.

A COAL-BURNING STEAM TRUCK

The Terminal Transportation Company, New York City, is the first to use a coal-burning steam road locomotive of the English type in this country.

The machines are of six or seven-ton capacity, and haul a trailer of three-ton capacity. They have a speed of six m. p. h., with or without the trailer, and have dumping bodies of the worm-gear type, which dump in five minutes. The dumping gear is operated by a belt from the motor.

Hard coal is used for fuel and the lowest grade oil for lubrication.

The vehicles are made by Fodens, Limited, Sandbach, London, Eng., and have a carrying platform 9 ft. long and 6 ft. wide and sides 3 ft. deep.

The boiler is built along the lines of the horizontal locomotive boiler and tested at 350 lbs. pressure. The total heating surface in firebox and tubes is 70 sq. ft.

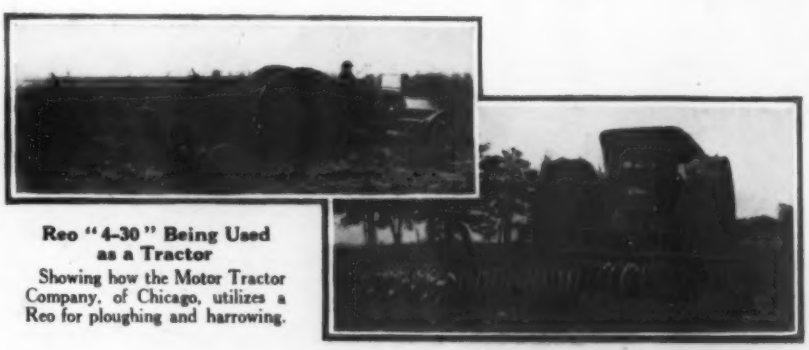
The engine is of the compound type. The steam-jacketed cylinders are 7 in. bore high pressure, and 6¼ in. low pressure, and 7 in. stroke. The engine is fitted with a high pressure gear whereby it can be converted into a double high pressure, each cylinder receiving steam separately from the boiler and exhausting independently into the funnel.

150 gal. of water, sufficient for an 18 or 20-mile run, and fuel sufficient for a 40-mile run are carried.

A single pump and injector is used for feeding water to the boiler.

A two-speed gear set, giving one speed of the three m. p. h. and another of six m. p. h., is provided. Gears connect the crankshaft and the jackshaft and chains connect it with the rear axle.

The driving wheels have a 4 ft. diameter and 12 in. face. The front wheels are 2 ft. 9 in. in diameter and 6 in. face. They have steel block tires.



Reo "4-30" Being Used as a Tractor

Showing how the Motor Tractor Company, of Chicago, utilizes a Reo for ploughing and harrowing.

Classified Advertisements

Position Wanted

Experienced Engineer—Designer, having successful heavy trucks in service, special designs. No scrap piles to his discredit. Now employed but open for engagement. State your salary limits first letter. Results, care this journal.

Position wanted as chief engineer or chief designer with responsible concern, preferably in the West or Middle West. Address Chief, care this journal.

Miscellaneous

Graduate Mechanical Engineer, aged 40 years, expert designer of farm tractors and motor trucks, with working and assembly drawings for new, strictly modern light farm tractor, ready for investment. Designer, care this journal.

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The Commercial Car Journal

is the logical paper for every man to read who contemplates buying or selling commercial motor cars.

It is brimful of essential information.

The Commercial Car Owner will also find many suggestions in it that will make his driving more efficient.

Send for a sample copy.

Commercial Car Journal

Market & 49th Sts.
Philadelphia, Pa.

A Substantial 3000-lb. Truck For $1775

The above illustration portrays a model C Dart Truck of 3000 lbs. capacity—the truck that has startled the motor truck world because of its low price and superb construction. $1775 for chassis, driver's seat, tools, etc. Body extra. 40 H. P. 4 cylinders. 4 1-16 inches x 5½ inches. Tires guaranteed 8000 miles. Eisemann magneto. Left hand drive. Differential and transmission of chrome nickel steel.

Dart Motor Trucks

Model E. D., 2 cyl., $750—Model B., 4 cyl., $1500—Model C., $1775.

The Canfield Lumber Co. is successfully operating Dart Trucks at its Waterloo and Cedar Rapids Yards. Dart Trucks are in use throughout the country, and every user will tell you of their low cost of upkeep and exceptionally good service. Write today for catalog and name of dealer.

The Dart Motor Manufacturing Company
Dept. "C J" Waterloo, Iowa

BALL~ BEARINGS

HB DWF

The Hess-Bright Manufacturing Company

Pioneers in the introduction of Annular Ball Bearings

Most extensive resources and plants in existence devoted exclusively to ball bearing manufacture. Enlarging and improving facilities, product and capacity for distribution.

Main Offices and Plant No. 2 on line of Penna. R. R. to New York
41 E. Erie Avenue, Philadelphia, Pa.

Stores for Retail Distribution:

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NEW YORK 1974 Broadway
CHICAGO 1800 Michigan Avenue

DURNO STARTER

SPINS THE MOTOR

DURNO AIR JACK

The Durno Starter for Motor Trucks

The practical motor truck starter. Compressed air—no wires, no batteries, no up-keep—nothing to get out of order. Powerful—positive. Fits any truck. Starts from driver's seat. Easy to install. No air in cylinders. Air for tires.

One-Year Guarantee—Send for Catalogue.

DURNO MANUFACTURING CO.

163 St. Paul Street Rochester, N. Y.

The Best and Most Automobile Literature for $2.00

The Commercial Car Journal	Annual Subscription Price - - -	$1.00
Horse, Truck and Tractor	Regular Price - - - - - - - -	$1.50
	BOTH FOR $2.00	$2.50

The **Commercial Car Journal** is universally recognized as the finest publication in its field. **Horse, Truck and Tractor** is written especially for horse-owners who find their horse-profits decreasing. This book has been written in collaboration by three experts in their respective fields—

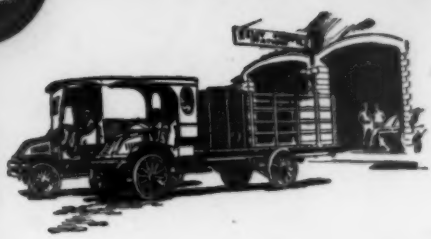
HERBERT N. CASSON, L. W. ELLIS and ROLLIN W. HUTCHINSON, JR.

Many of the facts are startling in their magnitude. As these writers claim that the total horse-cost is now $2,000,000,000 a year for maintenance alone, the problem of displacing horse-power by trucks and tractors is one of great interest to all concerned.

In offering you an annual subscription to the **Commercial Car Journal** and a copy of the book, **Horse, Truck and Tractor,** for $2.00, we are presenting an opportunity for you to obtain the greatest amount of valuable information on this important subject at the smallest cost. *Send your order today. Subscription Department.*

COMMERCIAL CAR JOURNAL, Market and 49th Sts., Philadelphia, Pa.

When Writing, Please Say—"Saw Your Ad. in the C C J"



An Invincible Combination

Kelly Trucks
Backed by
Kelly Service

This is the greatest combination in the motor truck field.

Kelly Trucks are built just right.

Their design is the result of seven years of uninterrupted observation of the natural evolution of the successful commercial car.

They are the last word in motor trucks.

That's why Kelly Trucks will do your hauling *just a little better.*

Kelly Service insures 100% truck efficiency. Our interest in a truck does not stop with its sale.

You are interested! Write us!

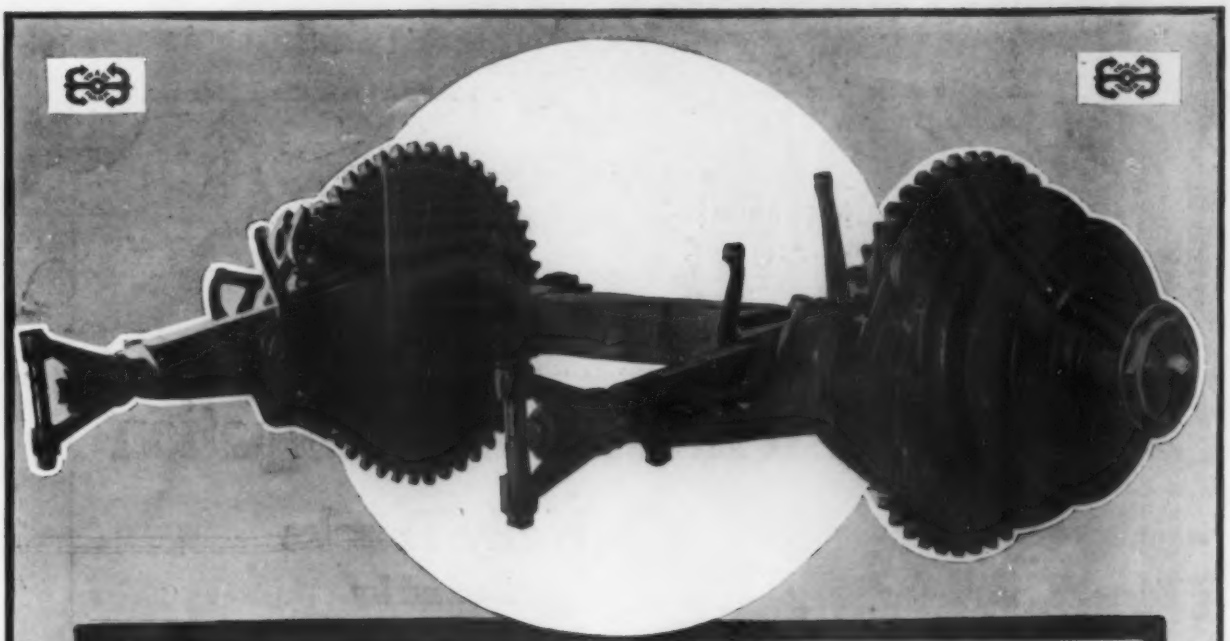
Dealers!

There is still some desirable Kelly territory open. Write us for our agency proposition.

The Kelly-Springfield Motor Truck Company

606 Burt Street Springfield, Ohio

(54)



Insist on Brakes Where Brakes Should Be — Next the Wheel

Efficient brakes are most certainly necessary; but proper location for the brakes is every bit as important.

SHELDON DOUBLE BRAKE REAR WHEEL EQUIPMENT has extraordinary features—both brakes are on the rear axle taking all the strain from the chain and doing away with 90% of the Jack-Shaft trouble. One set is operated by pedal—the other by lever.

The reaction due to the frictional force on the brake surface should be as close to the road wheel as possible. The closer the point of application of the brake force, the fewer the parts subjected to strain. This means a more efficient truck and increased safety both for the operator and for the public.

When you cut down to the minimum the number of parts subjected to strain you increase the efficiency of the brake. Obviously, the shortest distance between two points is the most effective designing.

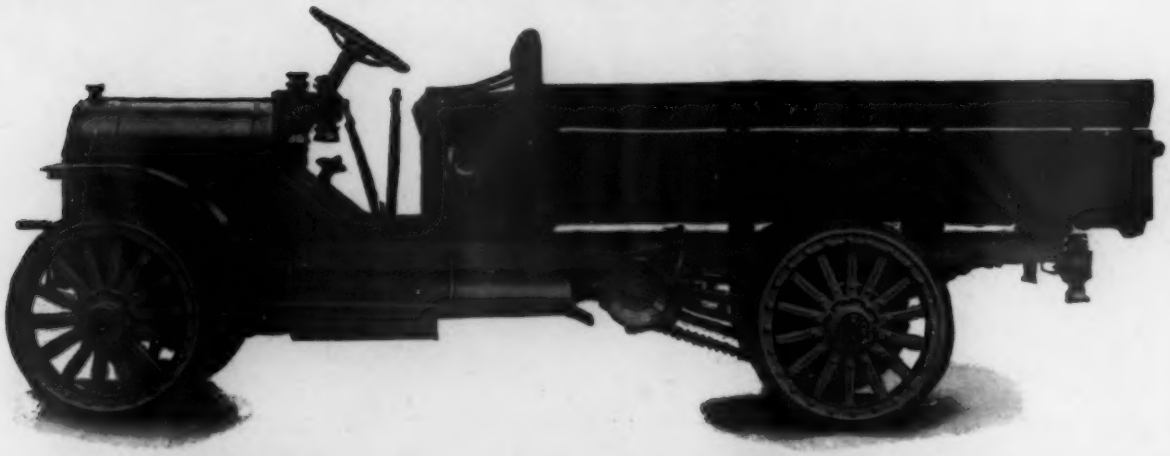
Why then, Mr. Engineer, do you still burden your mind with consideration of propeller-shaft, bevel-pinion, ring-gear, differential-housing, differential-gears, and with their bearings and drive-shafts, when SHELDON DOUBLE BRAKE REAR WHEEL EQUIPMENT relieves you of all these considerations—and makes your final product a *quality* truck with infinitely greater sales possibilities?

Write us today for further information on this vital subject of efficient braking

SHELDON AXLE COMPANY, Wilkes-Barre, Pa.

CHICAGO OFFICE: 68 E. 12th ST.
SAN FRANCISCO OFFICE: 444 MARKET ST.
DETROIT OFFICE: 1215 WOODWARD AVE.

132 H



REPUBLIC TRUCK

This is a good, live, selling proposition for active, aggressive agents who are alert to secure the greatest value in the commercial field. If you are of that type

You Want Us—We Want You

The **REPUBLIC** is standard in design and standard in all its parts. There enters into its construction no parts which do not come from established manufacturers of the highest reputation. Many parts are duplicates of those used by many manufacturers of 1½ ton capacity.

The **REPUBLIC** is made to be the best 1-ton truck in the field—one that will render service of the highest character and give unalloyed satisfaction. It is a truck that dealers will delight to handle, because of the way in which it proves and the commendations it earns.

These Specifications Prove Its Quality

Continental Motor	Gemmer Steering Gear	Covert Transmission
Schebler Carburetor	Bower Roller Bearings	Lewis Springs
Eisemann Magneto	Hartford Joints and Clutch	Left-Hand Drive
Russel Jack Shaft	Culver-Taylor Chains	Center Control

One-Ton Truck with Stake or Express Body $1425

GET THE AGENCY FOR YOUR LOCALITY. WRITE TODAY FOR OUR SELLING PROPOSITION

ALMA MOTOR TRUCK COMPANY, Alma, Michigan

General Sales Offices:—DETROIT, MICH. Address either point

Standard

MADE IN DETROIT

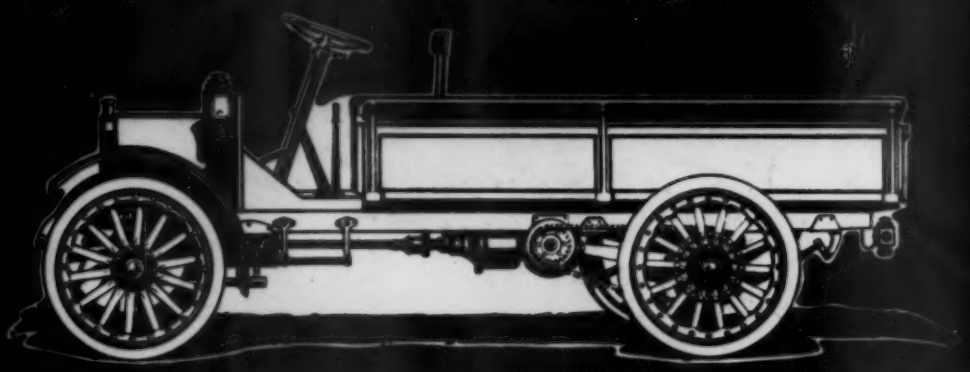
THIS is the age of the SPECIALIST. It is a recognized fact that an organization concentrating their entire energies on a SINGLE product, can make a better article at a LOWER PRICE than one that makes a variety of articles.

We are Specialists on 3-Ton Trucks

Likewise the great organizations which produce the component units of the **STANDARD** Truck are specialists in their respective lines. The **STANDARD** is an **ALL-STAR** assembly of the products of the world's most famous specialists. It contains such well-known products as—Continental Motor; Timken-Detroit Axles and Jack Shaft; Brown-Lipe Transmission, Clutch and Control; Gemmer Steering Gear; Perfection Springs, and Spicer Drive Shafts and Universal Joints. It embodies nothing but **STANDARD CONVENTIONAL DESIGN IN ALL PARTS.** No "Features," no new "Ideas," no unproved "Theories"—just **STANDARD** in **EVERY** detail. This policy of Concentration and Specialization, makes it possible for us to produce a Superior 3-ton truck at a very low price.

3-Ton—$2750

Standard Motor Truck Company, Detroit, Mich.



Specializing—Secret of MORA Quality and Price

IT can't really be called a secret—only a common-sense policy that can't help but work out to the MORA buyer's advantage,—both from the standpoint of the Wagon being built "Commercially Right" for Express Service, and remarkably low price for value received. While we build commercial cars exclusively, we go further—**specialize** in one size and build that size the best way possible. To the dealer we say—It's the right size—there's a bigger demand for a 2000-pound Express Service Wagon than for all other types combined.

Express
2000 lbs.
Service

MORA
COMMERCIALLY RIGHT

Price
$1400
Chassis

Just as the greatest values in pleasure cars are to be obtained from those makers who **specialize** in one model, in just that way is the MORA the best value in a 2000-pound commercial car.

Specializing explains its **made good** and **make good** qualities. There is no straddling or compromising of models—but one size that's built **right**—clean through. The problem of motorized delivery is constantly being studied from one point of view—how best to make a power vehicle to fit into Express Service.

Specializing has much to do with the MORA low price. Because—

There are four chief things that determine the selling price of a machine:—(1) Capital tied up in factory buildings; (2) Overhead expenses; (3) Cost of designing and other initial preparations for actual manufacturing; (4) Cost of materials and labor.

Building but one size machine enables us to keep down the expenses involved in the first three items. Therefore, by using part of this extra money necessarily paid by other makers for these things we are enabled to build better materials into the MORA and still beat them on the price.

The $1400 pays for **wagon** with but a small percentage for overhead and profit

Where does our profit come in—you ask?—from quantity of sales as a result of quality at so low a price.

DEALERS—Send for our attractive hanger in colors for your salesroom. It gives complete details and is a "silent salesman" that will interest people you never dreamt were likely to buy a commercial car. The hanger will give you an idea of one way we help our dealers.

The MORA POWER WAGON Co.
5326 St. Clair Ave. *Cleveland, Ohio*

HERE'S A HANDY COUPON—MAIL IT TODAY
THE MORA P.W. CO. 5326 ST. CLAIR AVE. CLEVELAND, O.
Send further details to

C.C.J. 8-13

RADIATORS

FLAT TUBE HONEYCOMB TYPE

Objections have been raised to practically all honeycomb radiators now on the market, but in our **FLAT TUBE HONEYCOMB RADIATOR** we have overcome the faults which characterized the others.

The chief difficulty has been the tendency to become easily choked up owing to the water passages being so small and irregular and the impossibility of cleaning them.

This trouble has been eliminated in our flat tube type. The tubes are amply large and run straight from top to bottom tank, thus avoiding clogging. The honeycomb appearance is maintained by a corrugated strip placed between each tube.

If tube is damaged these strips can be removed and tube repaired—an operation impossible with other honeycomb radiators.

This type is very desirable for trucks and commercial cars of moderate size, being both neat and durable.

Feel free to consult our engineering staff about your cooling problems.

LONG MANUFACTURING COMPANY
DETROIT, MICH.

SCHWARZ WHEELS

The fact that SCHWARZ WHEELS are specified for practically all commercial trucks whose designers have given the most careful attention to the safety factor is but additional evidence that automobile engineers have long acknowledged them to be the strongest, safest, most economical wheels a maker can put on his car.

The stress and strain to which a truck is subjected, and the tremendous loads it must carry, necessitate using wheels of the strength and endurance of which there can be no question.

When these considerations are paramount the choice invariably is **SCHWARZ WHEELS,** because they are constructed upon a different and better principle, resulting in greater strength, endurance and safety.

In **SCHWARZ WHEELS** the ends of the spokes are grooved and mortised so they interlock and form a rigid, immovable center assembly. This is a vast improvement over the old wedge-shaped spokes held together by glue. The advantage of the former and disadvantage of the latter have long been acknowledged by experts.

SCHWARZ WHEELS cannot loosen and get out of shape, become shaky or cease to run true. They are a mark of quality and an assurance of safety and freedom from wheel troubles, breakdowns, repairs and replacements.

To have **SCHWARZ WHEELS** on your trucks is to give your dealers a selling point of great strength and their customers the greatest value for their money.

Send for our literature

The Schwarz Wheel Co.

Frankford, Philadelphia, Pennsylvania

4,000 truck users have changed

from tires which they have tried and found wanting to Goodrich Wireless Truck Tires. Why not start right?

In one month 478 users of motor truck tires took off tires of various makes and substituted Goodrich Wireless Tires. Why? Because they were dissatisfied with continual adjustments and wanted the continuous service and economy of

GOODRICH WIRELESS DEMOUNTABLE TRUCK TIRES

These tires are equipping the trucks of thousands of concerns big and small. Here are a few of the businesses in which they are used:

Furniture Companies,	Sight-Seeing Bus Operators,	Express Companies,	Shoe Manufacturers,
Coal Dealers,	Wholesale Grocers,	Milling Companies,	Wholesale Butchers,
Fire Departments,	Oil Companies,	Wholesale Provision Houses,	Mining and Smelting Companies,
Transfer Companies,	Packers,	Ice Companies,	Brick Companies,
Brewers,	Department Store Owners,	Hardware Store Owners,	Stove Manufacturers,
Sand and Gravel Contractors,	Chemical Companies,	Plate Glass Manufacturers,	Soap Manufacturers.
	Bakers,	Storage Companies,	

Write for names of satisfied users of Goodrich Wireless Truck Tires in your line of business. Some of these concerns have delivery problems similar to yours. You'll be interested in learning their names and also in learning what their experience has been with the Goodrich Wireless Truck Tires.

Free booklets to help you

Write us on your business stationery and ask for any or all of the following books. We'll be glad to send them, without expense to you.

1—***"Motor Trucks of America"***—a condensed catalog giving the essential features of over 60 American-made Trucks. An authentic book of reference, compiled from data furnished by the truck makers for the busy man who wants to study Motor Trucks.

2—The Goodrich ***"Record of Cost"*** Book. This, with daily report cards which we also furnish free, enables you to tell just how much your trucks are costing.

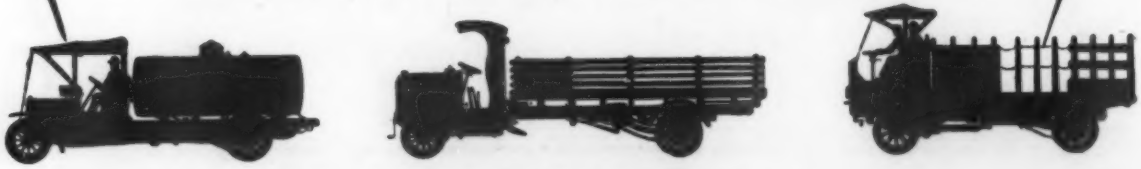
3—***"Goodrich Wireless Demountable Tires."*** An illustrated 40-page book which tells how Goodrich Wireless Tires are made, why they give steady, dependable service and also gives valuable ideas for the care of truck tires so as to get more mileage and better service.

The B. F. Goodrich Company

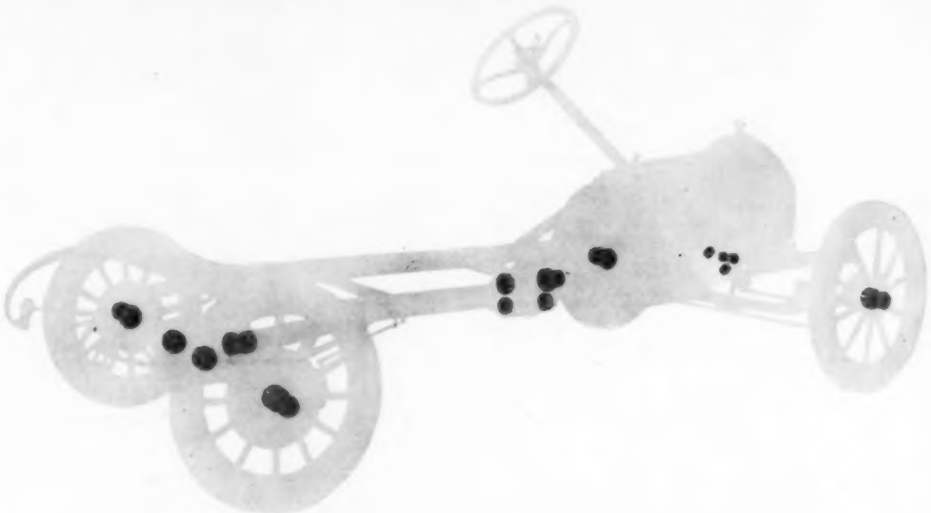
Makers of Goodrich Tires and Everything That's Best in Rubber

Factories, Akron, Ohio
Branches in All Principal Cities

There is nothing in Goodrich Advertising that isn't in Goodrich Goods



"BOWER SAVES POWER"



Twenty-one Places
Where "Bower Saves Power"

Location of Bower Bearings

4 in front wheels
4 in rear wheels
2 in differential gear
2 in propeller shaft
5 in transmission
4 in steering gear

21 total

The real power of an automobile is not that of its motor. It is the amount available after friction has taken its toll.

There are 17 principal places in an automobile where friction robs it of its power. There are besides four places where the power of the driver in steering may be wasted.

Friction is the thief of power.

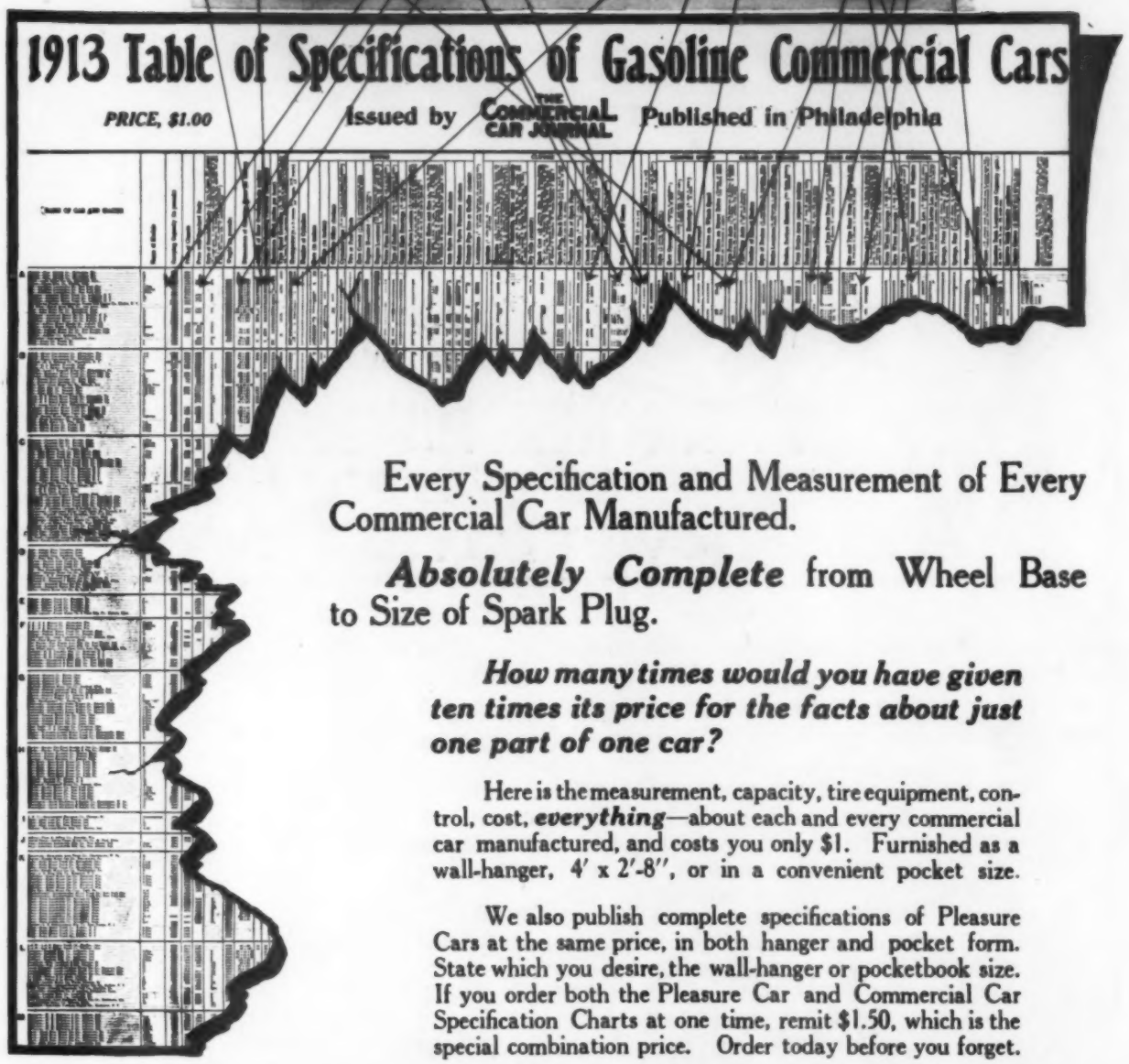
Bower Roller Bearings are Power's Guardian, because through their original design, a maximum diameter of roller is permitted, the rollers are self-aligning and the bearing never needs adjustment.

These are exclusive features.

Bower Roller Bearing Company
Detroit, Michigan

When Writing, Please Say—"Saw Your Ad. in the C C J"

ALL THIS INFORMATION About ALL CARS for ONLY $1


1913 Table of Specifications of Gasoline Commercial Cars
PRICE, $1.00
Issued by THE COMMERCIAL CAR JOURNAL Published in Philadelphia

Every Specification and Measurement of Every Commercial Car Manufactured.

Absolutely Complete from Wheel Base to Size of Spark Plug.

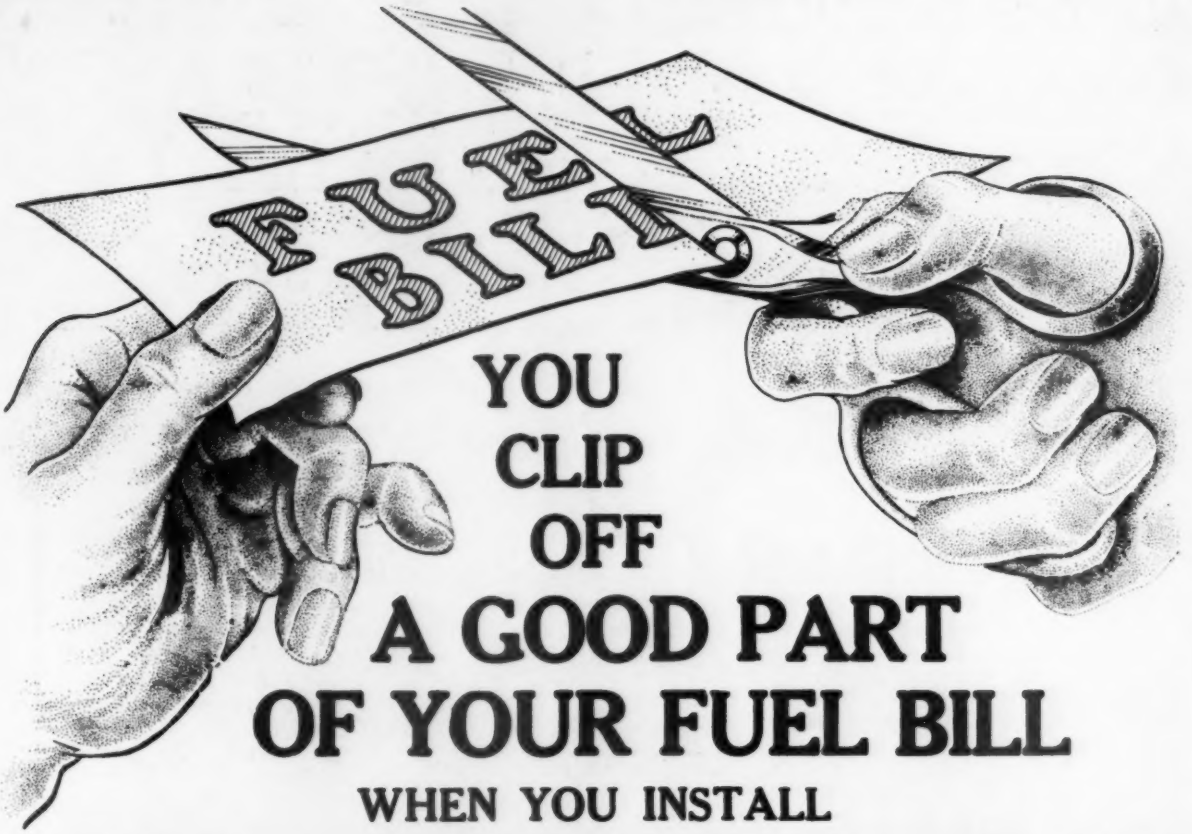
How many times would you have given ten times its price for the facts about just one part of one car?

Here is the measurement, capacity, tire equipment, control, cost, ***everything***—about each and every commercial car manufactured, and costs you only $1. Furnished as a wall-hanger, 4′ x 2′-8″, or in a convenient pocket size.

We also publish complete specifications of Pleasure Cars at the same price, in both hanger and pocket form. State which you desire, the wall-hanger or pocketbook size. If you order both the Pleasure Car and Commercial Car Specification Charts at one time, remit $1.50, which is the special combination price. Order today before you forget.

CHILTON COMPANY, PHILADELPHIA

When Writing, Please Say—"Saw Your Ad. in the C C J"



YOU CLIP OFF A GOOD PART OF YOUR FUEL BILL

WHEN YOU INSTALL

A BOWSER SAFE OIL-STORAGE SYSTEM

With the constantly advancing price of gasolene, it is mighty important that you get the use of **all** the gasolene you buy—in other words, why not turn **all** the gasolene you buy into mileage?

You can't do it using an above-ground storage tank or barrel. Evaporation continually takes place, changes in the temperature causing a great loss of vapor or gas. Supplying your car by hand causes yet more. You are constantly losing money because of the waste of gasolene which never had a chance to be turned into power.

Why continue these wasteful methods when the right way to correct them is at hand? The installation of a Bowser Safe Oil-Storage System will not only give you increased safety, but will materially reduce your fuel bills.

What that refrigerator is to your home a Bowser System is to your garage. And they are made to conform to that measure of safety prescribed by the National Board of Fire Underwriters and are labeled accordingly.

Treat yourself to a pleasant surprise by getting a BOWSER for your gosolene and lubricating oils. Price, size and style to exactly meet your needs.

Our booklet is worth reading —sent on request.

S. F. BOWSER & CO., Inc.

Home Plant and General Offices

Box 2118, Fort Wayne, Indiana

SALES OFFICES IN ALL CENTERS AND REPRESENTATIVES EVERYWHERE

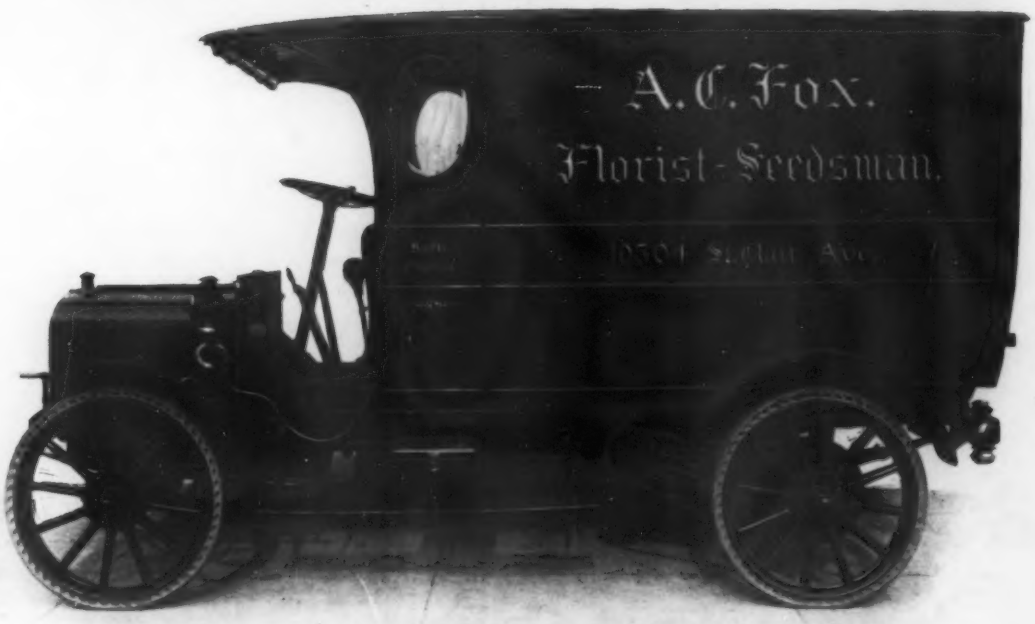
Original Patentees and Manufacturers of standard self-measuring hand and power-driven pumps, large and small tanks, gasolene and oil-storage and distributing systems, self-registering pipe-line measures, oil-filtering and circulating systems, dry-cleaners' systems, etc.

ESTABLISHED 1885

When Writing, Please Say—"Saw Your Ad. in the C C J"

THE IDEAL, PRACTICAL SOLUTION OF THE FLORIST'S DELIVERY PROBLEM LIES IN A

Bessemer Truck



A Model C Bessemer Truck Rendering Efficient Service for a Cleveland Florist

Florists' deliveries present different problems from those of the average store. The perishable nature of the goods, the necessity of delivering in perfect condition and at a specified time, the demand for many deliveries to fall within a certain few hours of the day and the need for an unfailing, unfaltering service make a condition which a light weight, easily operated and controlled, rapidly moving and dependable commercial car ***alone*** can satisfactorily supply.

The Model C Bessemer meets these conditions to a remarkable degree and is rendering most efficient service to the florist trade, earning the same enviable reputation as it has in other lines of work. This is made possible by the excellence of its materials and parts and the high quality of its workmanship. If yours is a light, or medium weight delivery problem, consult us.

Three Models—Bodies to Suit Purchaser

A—3000 lbs. Capacity, 30 H. P.—Price, $2100
B—2000 lbs. Capacity, 30 H. P.—Price, $1800
C—1500 lbs. Capacity, 25 H. P.—Price, $1250

DEALERS: You can make a profitable connection by handling this truck. Write for our sales plan and literature

BESSEMER MOTOR TRUCK CO.

BESSEMER

GROVE CITY
PENNSYLVANIA

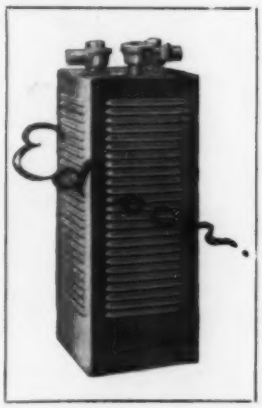
BESSEMER

EDISON FOR SERVICE

For Traction

The "A" Type

With an hour's boost at noon time Edison Storage Batteries will run a 5-ton truck 75 miles or more. 50, 55 and 60 miles per day are regular runs on one charge — seven days a week if necessary.



For Ignition

The "B" Type

The Edison Storage Ignition and Lighting Batteries are guaranteed and always on the job. The steel container cannot be broken. The Nickel-Iron Alkaline Battery can be left idle indefinitely, either charged or discharged, and is ready for service when wanted.

Whether for Traction, Ignition or Lighting the Edison is the only Battery you can *always* depend upon

Edison Storage Battery Company

141 Lakeside Ave.
ORANGE, N.J.

Write for information on the Edison Storage Battery and also for Bulletins on the Edison Alternating Current Rectifier for Charging Ignition and Lighting Batteries

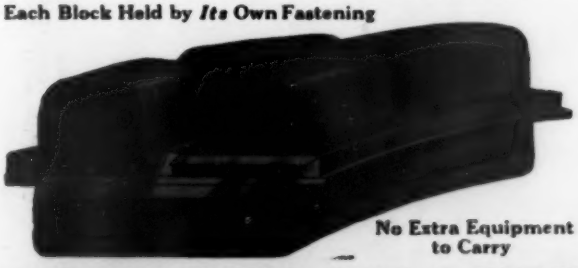
A Saving Tire for Heavy Trucks

The Goodyear Individual Block Tire, one of 7 great Goodyear Truck tires, saves time, trouble and expense. A tire of enormous traction power and of unequalled durability.

The characteristic feature of this tire is the method of fastening in the block. Each block held by its own individual fastening. To remove, replace or adjust *one* block you do NOT have to disturb another.

Think of the time that saves. And, besides that, since each block is held by its own fastening, it can always be kept tightly adjusted. That's an advantage obviously impossible where one retaining plate is screwed down against several blocks. This feature explains the greater durability and mileage offered by Goodyear Individual Block Tires.

Each Block Held by *Its* Own Fastening



No Extra Equipment to Carry

GOODYEAR
AKRON, OHIO
INDIVIDUAL BLOCK TRUCK TIRES

Easiest to Apply

No extra equipment to carry. No tire-applying station needed. Use ordinary wrench, unscrew two bolts, lift up plate, out comes block. And it goes back just as easy.

A Tire for Every Purpose
Truck Tire Book Explains All

Let us tell you more about the Goodyear Individual Block Truck Tire and 6 other saving tires for Trucks, a perfect tire for every purpose. Write for book on truck tires. Address

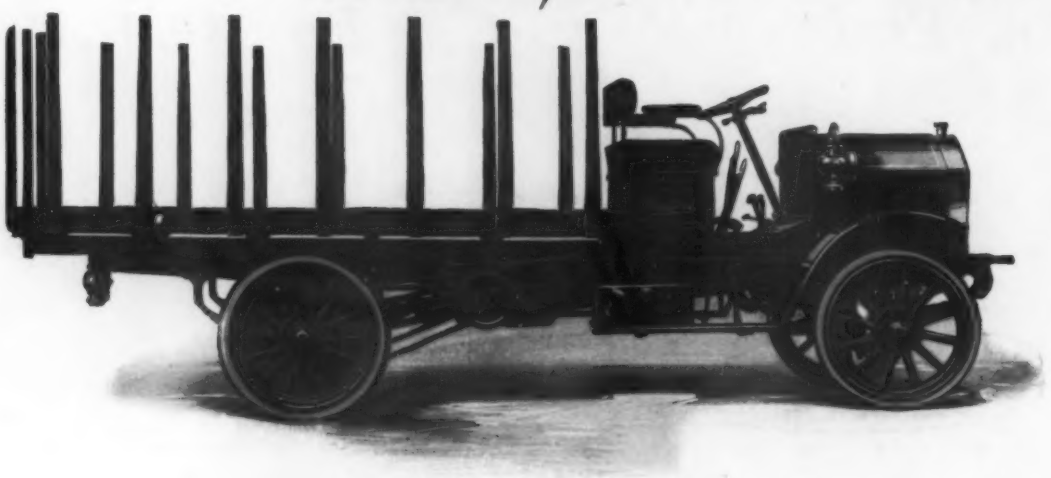
THE GOODYEAR TIRE & RUBBER CO., Akron, Ohio

Branches and Agencies in 103 Principal Cities

We make all kinds of Rubber Tires, Tire Accessories and Repair Outfits

Main Canadian Office, Toronto, Ont.; Canadian Factory, Bowmanville, Ont.

2 Ton **THE Rockford** Price $2,500



Considering quality, this truck is the best value in the market to-day. Every part selected with the greatest care, regardless of cost. Ask us for particulars. **A few good agencies are open.**

ROCKFORD MOTOR TRUCK CO. :: ROCKFORD, ILL.

Capacity One Ton

"LITTLE GIANT"

EVERYTHING THE NAME IMPLIES

A giant in performance but a dwarf in maintenance. Great carrying capacity, but low cost of upkeep. Remarkable value but very moderate price. These are the three great factors wanted by every keen motor truck buyer. You get them to a remarkable degree in this proven success which is making good everywhere and in every line of business.

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DEALERS

This is a car that will be profitable for you to handle. Here are a few reasons why it will put dollars in your pocket — Its unusually good value; its price is within every merchant's reach; its cost of upkeep is small; it is giving absolute satisfaction in scores of different lines of work and to thousands of owners; there is but one chassis, to which can be fitted every style of body — hence requires but a small investment on your part; it is backed up by a powerful company whose reputation and integrity stand back of every sale; it is a rapid seller, a sure repeater and a good profit earner. Some territory is still vacant — write today for our proposition.

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QUALITY ECONOMY

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DURABILITY RELIABILITY

Many successful motor car and truck manufacturers have found the most satisfactory disposition of their transmission problems in the adoption of the Covert Transmission.

The Covert name does more than to distinguish a superior product. It is a guarantee of dependability, and insurance against transmission difficulties of which you, Mr. Manufacturer, should avail yourself.

Specialized transmission engineers at the Covert plant stand ready to give you their assistance in adapting the Covert Transmisssion to your construction. Send blue prints if you wish this service.

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Sprockets—Blank or Formed.

Sprockets and Brake Drums—Combined for chain or internal drive.

Front Axles.

Radius Rods.

Every casting carefully annealed.

MICHIGAN STEEL CASTING CO.
DETROIT, MICH.

THE

Veeder

HUB ODOMETER

gives you an absolutely accurate record of every mile your cars travel. There is no going behind the returns; no doctoring of records; for it is made especially to prevent that. This alone makes it worth its price of

$25.00

How can you figure the efficiency of your cars, the capabilities of their drivers, the cost of your deliveries, the guarantee on your tires or any other essential cost factors, if you are not certain your mileage records are correct?

Every car and driver should be on a parity, and no trickiness or smartness of some dishonest driver should be allowed to falsify your records to his advantage.

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At your dealer's or direct from factory.

Send today for Catalogue D.

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Banded Motor Truck Springs

FOR THE MOST SEVERE SERVICE

¶ We are furnishing Springs for the best Motor Trucks and desire an opportunity to figure with you.

42 Years' Experience
Spring Making

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EXCLUSIVELY HIGH GRADE HEAT TREATED AUTOMOBILE SPRINGS

KALAMAZOO, MICHIGAN

Dependability

IS WHAT SELLS THE

ROWE MOTOR TRUCK

and enables you to increase your business after you have bought one.

The price is right—we do not have any expensive overhead charges that you have to pay for, and the Rowe factory is less than an hour from Philadelphia. The weather does not affect the Rowe; it is built for service **all** the time—24 hours a day when needed.

Worm or chain drive. Built in 1 to 5 ton sizes.

Philadelphia Branch—647 N. 42nd St.

Rowe Motor Manufacturing Co.
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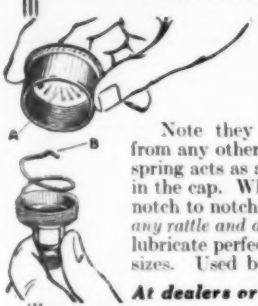
The EVANS Model "HELE-SHAW" CLUTCH

The most flexible and powerful clutch in the world. Over 100,000 in actual use. Multiple disc running in oil. The only clutch that is, or can be made with wedge-shaped, annular-grooved, twin plates. This construction makes continuous slippage possible and assures smooth, silent pick-up and absolutely positive engagements. Is most durable, gives absolute control, maximizes safety and eliminates the jerk.

Write for catalog 7 for complete data



M & E Grease Cups

Note they are constructed entirely different from any other grease cup. The end (B) of spiral spring acts as a pawl catching in corrugations (A) in the cap. When cap is turned the pawl slips from notch to notch holding the cap rigid. *This eliminates any rattle and absolutely prevents cap being lost.* They lubricate perfectly. Made in brass or steel—all sizes. Used by the best car manufacturers.

At dealers or write for catalog 23 and samples

MERCHANT & EVANS COMPANY
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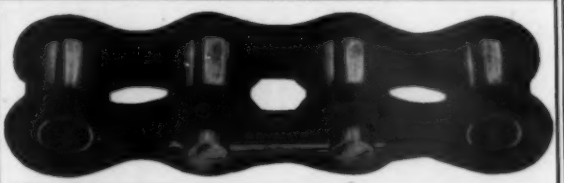
M&E



"The Coventry" Detachable Roller Chain

Note the large heavy-duty cotter-pin connecting the two rivets. The mechanical superiority of this method of coupling can easily be appreciated. Vibrations and jars cannot weaken the double-size coupling as is the case where two smaller cotter-pins, one for each rivet are employed.

Combine the established reputation of "The Coventry" Chains for precision, perfect retention of pitch and unparalleled durability with this final touch of perfection and you will understand why "The Coventry" Chains are consistently specified by those desiring the maximum of transmission efficiency.

Our catalog comprehensively covers "The Coventry" line, and will be sent immediately upon request.

Sarco Engineering Co.
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ROSS STEERING and DIFFERENTIAL GEARS

are standard on good motor truck construction

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ACME Universal Joints

Different from all other joints.

Simpler and better construction.

ACME Joints are best adapted to stand the severe wear and strain to which Universal Joints are subjected.

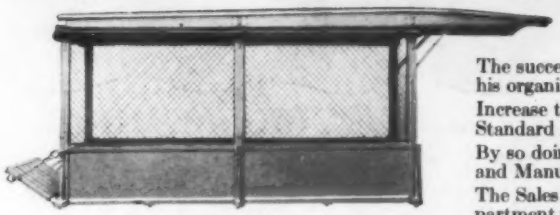
They are remarkable for their simplicity, durability and efficiency, and possess advanced mechanical features not found in other joints.

These qualities have caused them to be adopted by many leading motor truck manufacturers, who use them exclusively.

We can meet your requirements as well as we have theirs. Send for catalog and specifications.

The Acme Universal Joint Mfg. Co.
1421 Fulford Street, Kalamazoo, Mich.

Highland Standard Bodies for Motor Trucks



Box Body

To Standardize is to Economize

The success of the Motor Truck Manufacturer depends upon the Efficiency of his organization.

Increase the Efficiency of your organization by adopting the Highland Line of Standard Bodies.

By so doing you increase the efficiency of your Sales, Engineering, Purchasing and Manufacturing departments.

The Sales Department determines the size and style of body. Equip the Sales Department with the Highland Body specifications and the rest will follow naturally.

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THE HIGHLAND BODY MANUFACTURING COMPANY, CINCINNATI, OHIO

The

Commercial Car Journal

is the logical paper for every man to read who contemplates buying or selling commercial motor cars.

It is brimful of essential information.

The Commercial Car Owner will also find many suggestions in it that will make his driving more efficient.

Send for a sample copy

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The Largest Exclusive Motor Builders in the World

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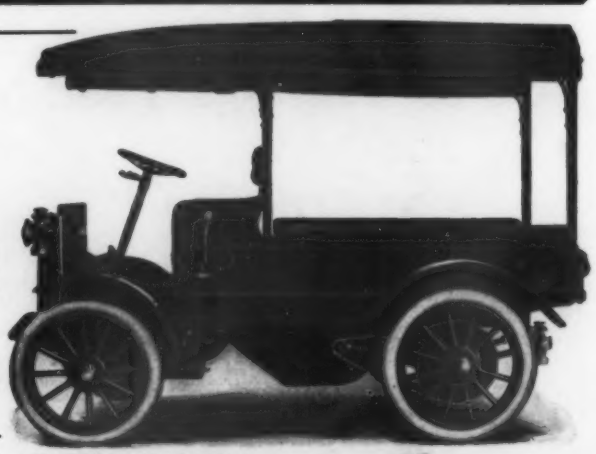
"BEST"

1000 to 1250 lbs. Capacity

42" x 72" Loading Space

Price, with Top, Pneumatic Tires } $890.00



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DURANT-DORT CARRIAGE CO.

FLINT, MICH.

Make your motor truck as easy to handle and as economical in upkeep as a pleasure car, by installing

SIMPLE—STURDY—ACCESSIBLE

Dyneto-Entz

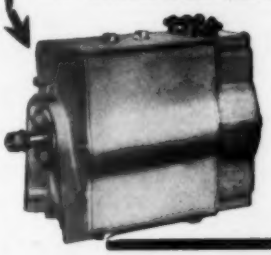
TRADE MARK

Electric Starter and Lighting System

Don't expect your driver to break his back cranking a big engine. He would rather let the motor run from morning till night. **You pay for gasoline—he doesn't.** When your truck stalls on the road or in traffic, think of the time it takes the driver to get under way again.

Give Your Truck Driver the Dyneto-Entz Starter

The truck manufacturer can make room on any new car for the Dyneto-Entz. On an old car a garageman or mechanic can find room for the Dyneto-Entz. One Switch does away with all other controls. A single unit motor generator not only starts the engine every time, but keeps the storage battery charged. The storage battery can not be overcharged. The wiring is simple.



The Dyneto-Entz means that you never have a Stalled Car. Standard Equipment on Franklin, White, Tribune, Stewart, Chase and Other Cars.

Write for Full Particulars

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Dept. M SYRACUSE, N. Y.

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USE KEROSENE

CUT YOUR FUEL EXPENSE IN HALF

WITH THE

G. C. VAPORIZER

It **runs any motor on kerosene** and the cheaper fuels **better** than on gasoline, and operates **without carbon, odor** or **smoke.**

Every truck owner and user should learn all about this extraordinary motor improvement by sending for our booklet,

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There is no Limit to the Usefulness of GOULD-Storage-Battery-Driven Delivery Wagons

Some firms that deliver provisions and the like require large, others small, vehicles. They **all** demand **prompt, reliable delivery service at reasonable operating cost.**

The following are a few from many that have electric wagons driven by Gould Storage Batteries:

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Sulsberger & Sons, Packers, New York
Dold Packing Co., Buffalo
Union Terminal Cold Storage Co., Jersey City
Reeves Parvin Co., Groceries, Philadelphia
Great Bear Spring Co., Water, Philadelphia
Pepsicola Bottling Co., Wilmington, Delaware
Hill & Hill, Ice, Methuen, Mass.
Senter Pie Co., Pastry, Denver, Col.
Hoeffler Ice Cream Co., Buffalo
Chapin & Sachs Co., Ice Cream, Washington
Henry Maillard, Candy, New York

Most of these firms have for years been staunch advocates of the Gould Storage Battery; simply because the extreme mileage per charge, the low annual upkeep cost and the absence of maintenance troubles have proven the Gould Battery the best buy on the market.

Gould battery renewals fit jars of any make.

Tell us your conditions and size of battery and get our prices.

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Gould Storage Battery Co.

General Offices: 30 E. 42nd St., New York
Works: Depew, N. Y.

Agents in all large cities
Full stock carried in all cities where we have offices or agents

(73)

Swinehart Cellular Truck Tires

Most resilient solid tire made. Absolutely non-skid. Increases traction and eliminates undesirable slipping and friction. Does away with the use of chains. The holes in the tire act as a radiator, preventing excessive heating and internal friction. The extra large surface of the Swinehart tread reduces the pressure per square inch to a point well within the safe and economical limit.

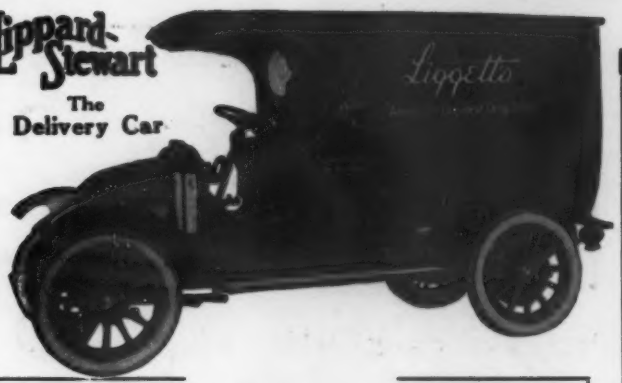
The wonderful elasticity, due to the combined use of our cellular design and the highest grade of rubber, allowing the tire to "give and take," to stand the road shocks without damage, is the true secret of Swinehart longevity. Demountable Quick Attachable.

We also make a full line of smooth tread and block tires, single and dual.

THE SWINEHART TIRE & RUBBER CO.
AKRON, OHIO

Boston Branch, 727 Boylston Street

Lippard-Stewart
The Delivery Car



Lippard-Stewart Cars
Guarantee Efficient Delivery

Lippard-Stewart Delivery Cars give service because they are built to give it. They assure quick and dependable delivery over a wide territory at the minimum cost per package, because they are constructed by engineers who know and have fulfilled every requirement demanded of a thoroughly efficient delivery vehicle.

Read These Special Features of Lippard-Stewart Construction

Continental 30 H. P. Motor — Timken Roller Bearings Throughout
Eisemann Magneto — Special Spring Suspension
Brown-Lipe Selective Transmission — Left-Hand Drive
Cone-Clutch — Every Part Easy of Access
Full-Floating Timken Rear Axle — Tires—35 x 4½ Front and Rear

Lippard-Stewart Motor Car Co., Buffalo, N. Y.

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USED IN CONJUNCTION WITH ANY CARBURETOR WILL

Reduce Gasoline Bills 25% to 40%

It thoroughly mixes the gasoline so that its full power-producing qualities can be utilized, giving increased power, particularly at low speed and on heavily loaded vehicles.

Price, $5.00

Mondex Shock Preventer

A device that absolutely controls the action of the springs by graduated compression of rubber. Heavy shock meets with much resistance, light shock with light resistance.

Made for light and heavy cars

Mondex Polish for automobile bodies and all varnished surfaces. Dries instantly, leaving a brilliant lustre. Free sample on request. Agents wanted everywhere.

THE ARISTOS CO.
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RELIANCE AUTOMOBILE CO., San Francisco, Cal.
Agents for Pacific Coast

Motor Truck Bands

MADE WITHIN THE FOLLOWING

Dimensional Tolerances

(ADOPTED BY THE SOCIETY OF AUTOMOBILE ENG.)

1.—Tolerance in circumference of felloe band:

	Plus	Minus
Before application to wheel - -	1-32"	1-32"
After " " " - -	1-16"	1-32"

Variation from precise measurement shall be uniform over entire width of band.

2.—Tolerance in width of felloe band:

	Plus	Minus
Up to and including 4" - - -	1-32"	1-32"
4—1-16" to 6" - - - - -	3-64"	3-64"
6—1-16" to 12" - - - - -	1-16"	1-16"

3.—Variation in trueness of band when placed on surface plate: Band shall touch at all points within 1-32" up to and including 6" width. Over 6" width within 1-16".

4.—Variation in thickness of band: .006" plus or minus.

5.—Trueness to round. The radial tolerance on the wheel when felloe band is applied shall be 1-16" plus or minus. This plus or minus tolerance must not occur at diametrically opposite points. There shall be no flat spots or kinks in felloe band on the finished wheel.

The Standard Welding Company
CLEVELAND
NEW YORK CHICAGO DETROIT

1909 1913

Pioneer Truck Steering Gear Mfrs.

We make more steering gears for commercial vehicles than any other manufacturer.

WHY?

Because the truck manufacturers recognize that the Lavigne all-steel gear is of superior design and the ultimate user **knows** it.

Standard For:—Commercial Cars, Trucks, Tractors, and High-Grade Pleasure Cars.

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WE SPECIALIZE IN HIGH-GRADE

AUTOMOBILE PARTS

TRANSMISSIONS GEAR SHIFT LEVERS
STEERING GEARS DIFFERENTIALS
ELECTRIC STARTERS

THE WARNER MANUFACTURING CO.
TOLEDO, O.

TOLEDO

KING 3½ Ton Truck

There is no question as to the quality and efficiency of the King. This means low cost of maintenance. If you want a truck that will do real work and stay on the road, it will pay to investigate.

We can give you the service
Territory for reliable agents

A. R. KING MANUFACTURING CO., Kingston, N. Y.

FEENY UNIVERSAL JOINTS

NO MOVING COVER OR LEATHER BOOT

ABSOLUTELY DUST PROOF

No dust can penetrate this joint, for it is absolutely sealed within a rigid, dust-proof, oil-tight housing, which is integral with the joint members, ensuring perfect lubrication.

Actual measurement has proven that the "Feeny" has more bearing surface than any other universal joint, and its efficiency is still greater because of that surface being *flat*.

If you want a universal joint so efficient and well made that it is virtually trouble proof, learn about the Feeny. Its distinctive merit will appeal to you. Sold under a guarantee.

THE FEENY-HURD CO. :: :: MUNCIE, IND.

Model "B" 2-Ton
Chassis $2100

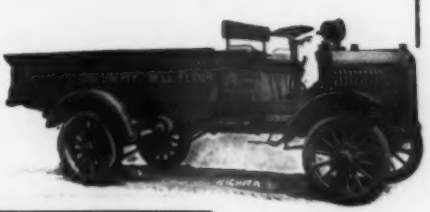
WICHITA TRUCKS

1 and 2 Ton Capacities

Dealers: Write or wire us for sales proposition, territory is being snapped up rapidly.

Wichita Falls Motor Company
WICHITA FALLS, TEXAS

Model "A" 1-Ton
Chassis $1650



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ADLER WERKE

BALL BEARINGS

"INSURANCE FOR BUILDER AND USER"
RHINELAND MACHINE WORKS CO
140 WEST 42nd ST NEW YORK, N.Y.

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GEBRUDER STOEWER ARIES KELLY NAGANT PANHARD PEUGEOT DELAHAYE MACK DE DIETRICH AUTO-METALLURGIQUE

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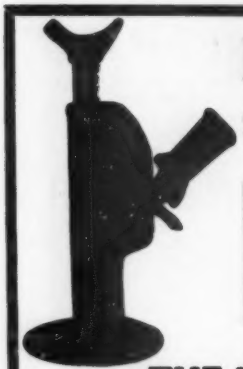
Real Square Tube Radiators

¶ Commercial cars require radiators that will stand many shocks and much hard usage. This was one of the weak parts of the commercial car but the test of time has proved that FEDDERS radiators render efficient service.

¶ We want to figure with you your requirements for the coming season. If you haven't used Fedders radiators you probably have had a great deal of radiator trouble and you may think that there isn't a radiator built that will give you satisfaction. If this is the case we would like to have an opportunity of demonstrating that the Fedders radiator will stand the wear and tear and shocks of the commercial car and that manufacturers who equip their commercial cars with the Fedders have practically no radiator trouble. We can convince you. Will you give us the opportunity?

FEDDERS MFG. CO., Inc.
BUFFALO :: NEW YORK



BUCKEYE Motor Truck Jacks

Buckeye Motor Truck Jacks are safe, reliable and made to stand the wear and tear for which they are intended. They are fully guaranteed, and cannot possibly drop with a load. They are made from Steel Drop Forgings, best finish and workmanship throughout.

Get our prices before you place your orders for jacks, we can save you money.

No.	Height Bar Down	Raise of Bar	Height Bar Up	Weight	Capacity		List Price
7	11¼"	6⅛"	18"	16 lbs.	2½ tons	with formed handle	$10.00
13	14¾"	7⅛"	20¼"	26¾ "	3 "		15.00
14	14¾"	7⅛"	20⅝"	33 "	5 "		16.00
9	11¾"	6"	17¾"	10 "	1½ "		6.00

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Universal Joints

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SPICER MFG. CO. - - PLAINFIELD, N. J.

B. A. Gramm's Motor Trucks

Newest Designs, Latest Improvements; Built in every detail to insure satisfactory and permanent results.

Write for photographs, descriptive literature and the exceptional values we offer you—far beyond all others.

The Gramm-Bernstein Co.

Exclusive Motor Truck Builders

Lima, Ohio, U. S. A.

Gear Steel

BY

The Cross Rolled (United) Process

Free from Seams and of Uniform Quality

Don't permit your competitor to have a talking point over you.

Cross Rolled (United) Steel offers one of the latest and strongest talking points that you can secure.

It also gives you assurance that the labor and expense you put into your manufacture is not going to be ruined by an inferior or even an ordinary steel.

No matter whether it is Chrome Vanadium, Nickel, Chrome or Special Analysis O. H. Steel, we can offer you the same superiority and exclusiveness.

Write today for quotation and data.

The United Steel Co., Canton, Ohio

NEW YORK CHICAGO DETROIT

"The Truck That Does the Most Work"

This is the slogan we have adopted for the Avery truck because of its ability to do the big things, haul the big loads, and make the big profits for its owner.

Out of 36 testimonial letters received in one month from satisfied users of Avery trucks, seven of the letters gave the number of horses and men the truck and driver replaced. Adding these together we found that 7 Avery trucks and 7 drivers were doing the work of 86 horses and 26 men. A truly remarkable record. In this comparison as in many others it is shown that Avery trucks are doing the big things. It is because of such records as these the above slogan was adopted.

The Avery line of trucks is complete. All sizes are made from one to five ton capacity. Write for the new truck catalog. It's just off the press. Address:

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Absolute Necessity for Commercial Cars

SUCCEED WHERE OTHERS FAIL

Endorsed by:

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Try a set at our expense

We also make bumpers to protect radiator and other vital parts at front of truck.

J. H. SAGER COMPANY

293 South Ave. - - Rochester, N. Y.

Ford

If there were no Fords, automobiling would be like yachting—the sport of rich men. But by centering his effort upon the production of one good car, Henry Ford has brought the price down within reason—and the easy reach of the many.

Here's the test: 300,000 Fords now in service. Runabout, $500; Touring Car, $550; Town Car, $750—f.o.b. Detroit, with all equipment. Get catalogue and all particulars from Ford Motor Company, Detroit, Michigan.

Steel Tanks

Air-Starter Tanks
Gasolene Feed Tanks

Our extensive manufacturing facilities enable us to meet your every requirement.

111 years old. Founded 1802

Wm. B. Scaife & Sons Co.

New York Office
26 Cortlandt Street

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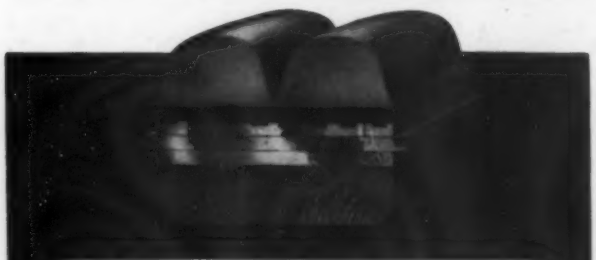
Send also for catalog of
GASOLENE STORAGE OUTFITS



3 BIG FACTS YOU SHOULD KNOW

about the Republic Steel Base Motor Truck Tire: 1, that this tire holds securely to the rim and cannot creep, because it is keyed on under high pressure; 2, that you can run it clear down to the hard rubber counterbase without causing chunks of the rubber tread to tear out; 3, that only external road-wear can affect it.

These three features make this motor truck tire more economical and efficient than any other style of tire. Let us give you the full facts and figure on your requirements.

THE REPUBLIC RUBBER CO., YOUNGSTOWN OHIO

BRANCHES AND AGENCIES IN THE PRINCIPAL CITIES

REPUBLIC
STEEL BASE
MOTOR TRUCK TIRE

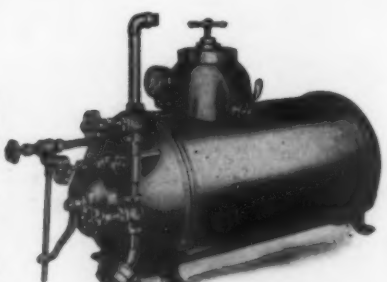
Chemical Fire Apparatus

HAND EXTINGUISHERS and TANKS

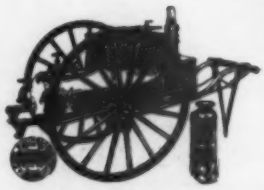
of every description for department apparatus. We are equipped to make tanks of any size or type.

3-Gallon Approved Extinguisher

We also provide a complete line of Chemical Engines, mounted on wheels for service in factories, towns, villages, etc. Hose Reels, Hose Axles, Ladders, Hooks, etc.



35-Gallon Copper Tank



We can equip any chassis complete with body, chemical apparatus, etc. *Ask us.*

O. J. CHILDS CO.

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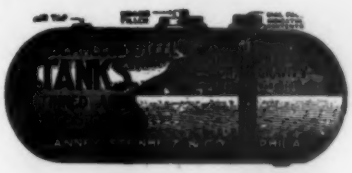


This is the

"Jasco Tank"

¶ It is made absolutely seamless and leakless, of drawn steel, thoroughly tinned and tested. It is

THE SAFETY GASOLENE RECEPTACLE FOR THE AUTO

¶ It not only insures the safety of the car and its occupants, but stops the constant drain on pocketbooks caused by waste of gasolene. Made in all standard styles and sizes.

JANNEY, STEINMETZ & COMPANY

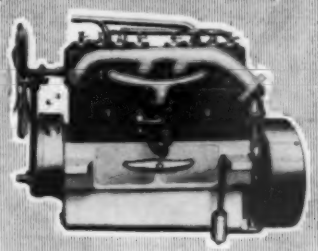
MAIN OFFICE: PHILADELPHIA, PA.
NEW YORK OFFICE: HUDSON TERMINAL BLDG.

YOU wouldn't expect a race horse to do draft horse work. Then why expect satisfactory Truck service with a pleasure car motor?

Truck work requires a motor with a capacity for continuous hard work. That is efficiency—and is exactly what you get in the Waukesha Long Stroke Truck Motor. It's a "make good" motor that gives the truck manufacturer full confidence that his truck will do all he claims. Strength—long wear—economy of fuel—the ability to work under all conditions—those are what you get in every

WAUKESHA

4¼ × 6¾" LONG STROKE TRUCK MOTOR



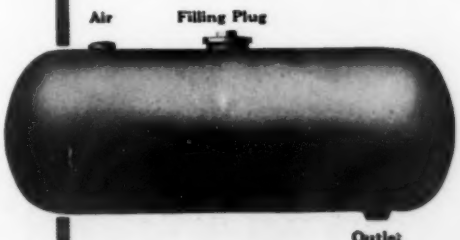
Waukesha Motor. The crankshaft has a tensile strength of 70 tons. The bearings have three times the wearing quality of ordinary bearings. Let us *prove* the Waukesha Motor's supremacy. Ask us in the next outgoing mail.

WAUKESHA MOTOR CO. Dept. A. WAUKESHA, WIS.

Seamless Steel Products

Brake Drums

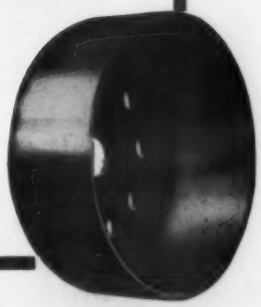
Pressed Steel Tanks



Heavy Flanges, etc.

Any Diameter, Gauge or Height

Federal Pressed Steel Co.
Milwaukee : Wisconsin



KOEHLER COMMERCIAL CAR

CARRYING CAPACITY 1600 LBS. PRICE $750.

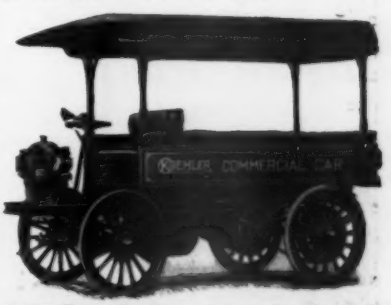
DEALERS—"This is Your Opportunity to Get in the Truck Business Right!"

Certain factors are highly desirable for the dealer starting in the truck business. Among them are the securing of a car which is adaptable to almost every line of business—giving a wide field in which to operate; a car which is of low price and only one model—thus requiring but a small initial investment; a car which has a reputation for economy of maintenance and large carrying capacity—these are strong selling points; a car easy to operate and simple in construction—this avoids trouble, expensive repairs and creates a good reputation. You get each and every one of these in a

KOEHLER COMMERCIAL CAR

This car will make big money for any live dealer of push and energy. Get the agency for your town.

Motor—24 H. P., two-cylinder, water-cooled; Carburetor, Model L. Schebler.
Lubrication—Positive mechanical and integral.
Ignition—High-tension Bosch magneto, no batteries or coils.
Transmission—Planetary: all gears genuine chrome-nickel steel which, together with bevel drive and differential gears, run in constant oil bath.
Wheels—36" front and rear.
Tires 2½", solid, fitted on demountable rims.
Wheelbase—90".
Tread—58".



1600 Pounds Capacity and only $750

Write at once for full particulars

H. J. KOEHLER S. G. CO., 1709 Broadway, New York N. Y.

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Raybestos
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"THE ORIGINAL AND BEST ASBESTOS BRAKE LINING"

Cannot burn out. In hottest weather, down steepest hills, the heaviest truck can rely on its brakes if they are lined with RAYBESTOS **—the Standard Brake Lining of the Industry.** It is made of genuine long fibre asbestos, specially woven and treated.

Built to stand the extreme strain to which heavy trucks subject it. Comes in all widths. The name is stamped in every foot for your protection.

The ROYAL EQUIPMENT CO.
Railroad and Bostwick Avenues
BRIDGEPORT, CONN.

We also make Duplex and Raymond Brakes and Gyrex, the Mixer

34-feed double compartment
Detroit Force Feed Oiler

Largest Oiler ever built

This oiler provides for the lubrication of every part of the power plant. A separate feed goes to each part requiring lubrication and each feed can be regulated to supply **exactly** the right amount of oil at every varying speed without further attention.

A partition divides the tank into two compartments—one for gas engine oil and one for a heavier, cheaper oil for the bearings, gears, etc.

Detroit Oilers are made for **every** kind of engine—commercial truck, automobile, gas tractor, marine and stationary — with pulley, ratchet, gear or sprocket drive for **easy** installation on any outfit.

Detroit Oilers are insurance against lubrication troubles.

Specify a Detroit Oiler on your next truck or put one on your present outfit.

Write today for Catalog P-67 and full information, stating in what kind of engine you are interested.

DETROIT LUBRICATOR COMPANY.
DETROIT, U. S. A.
Largest manufacturers of lubricating devices in the world.

A&R **A. & R. Trucks Offer** A&R
A GOLD BOND INVESTMENT

and pay big dividends to the motor truck owner who demands an efficient, durable, as well as dependable trucking equipment, capable of producing the lowest haulage cost possible.

A. & R. owners, in widely varied lines of business, have found these trucks superior to any they have ever used. They are right in construction and right in price, a combination that meets with little competition. Re-orders prove their faith and the value of their investment, for re-orders alone offer true evidence of lasting satisfaction.

The same high manufacturing standard, established in 1867, by the Abendroth & Root Manufacturing Company, in the manufacture of products for the engineering field, has been carefully maintained in the building of A. & R. Trucks. It is our guarantee of superior truck construction.

There are many other convincing facts you should know. Send for A. & R. MotorTruck Booklet, prices, etc., today.

Dealers: We have a number of good sales territories still uncovered. Write for particulars.

ABENDROTH & ROOT MFG. CO.
SINCE 1867
A&R **46 CHURCH ST., NEW YORK CITY** A&R
Works: Newburgh, N. Y.

SPLITDORF

"Always There"

Investigation by Commission

may have its advantages from a Congressional standpoint, but PERSONAL INVESTIGATION cannot be surpassed as a means of obtaining a real intimate knowledge of the superior qualities of SPLITDORF SPARK PLUGS.

And SPLITDORF PLUGS will come through any and every personal investigation—no matter how thorough, or how searching—with the unqualified endorsement of: "THE BEST SPARK PLUG ON THE MARKET."

There's no dodging the issue—the SPLITDORF ELECTRICAL COMPANY is bigger and better than ever—it GUARANTEES ITS PRODUCT and stands committed to every claim it makes for the goods bearing its trademark.

A PERSONAL INVESTIGATION TODAY will convince the most skeptical that the SPLITDORF SPARK PLUG, with the hexagonal porcelain, and with the SPLITDORF trademark stamped on the shell, is the common-sense plug for everyday usage—gas-tight, soot-proof and unbreakable.

Remember, all! "New ignition for old" is our slogan—we have a SPECIAL EXCHANGE proposition of the greatest interest to every owner of a gasoline motor who would save time and money. Write or call TO-DAY for particulars.

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THE RUTENBER MOTOR

Manufactured since 1901 for high-grade

Automobiles

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3¾ x 5¼ four and six cylinder
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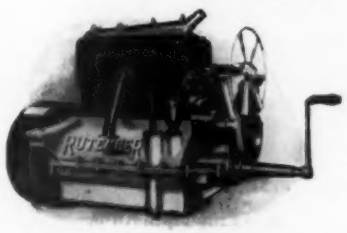
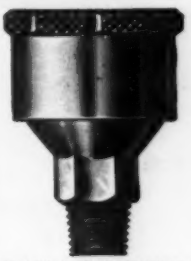
Standard or Unit
and
4 x 4, 4½ x 5 and 4¾ x 5 Standard Types
All L-Head, 4-Cycle



Manufacturers are invited to investigate our service and our facilities. Literature on request.

The Rutenber Motor Company
MARION, INDIANA



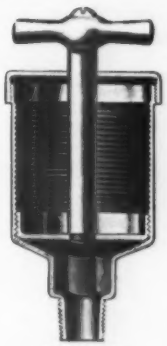
PLAIN COMPRESSION
(Patented)

Empress

BRASS AND STEEL
GREASE
AND
OIL CUPS

WE MANUFACTURE
a full line of Plain, Leather Packed, Ratchet, Marine, Spring Compression, and many other styles of Grease Cups.

Our line of Oil Cups is equally satisfactory and complete.



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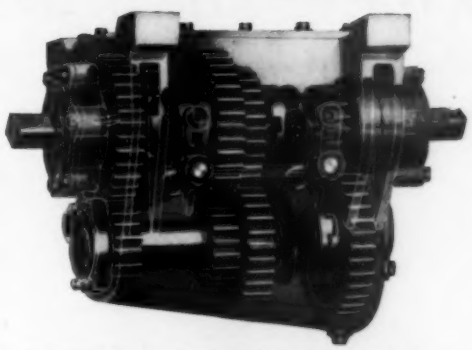
Catalogue on Application

Bowen Manufacturing Co.
AUBURN, N. Y.

COTTA TRANSMISSIONS



Internal View of Shaft-Drive Transmission, designed for use in worm-drive trucks

For Heavy Truck and Tractor Service
Eliminate Transmission Trouble

Selective type, individual clutch system. All gears always in mesh. Countershaft and mainshaft gears idle on direct. Improved speed-changing device. No plain bearings —loose gears mounted on roller bearings.

Write for Bulletin

COTTA TRANSMISSION CO.
814 So. Main Street Rockford, Illinois

Send For This Free Booklet

For the owner, or for the man who finishes autos and carriages, this little booklet entitled "The Care of the Car," will be found full of practical suggestions.

It tells the owner how to keep his car in the best of condition and what to specify when having the car done over.

It demonstrates to the finisher why permanent results pay best and why no jobs need "go wrong."

It contains a number of popular color samples and a novel plan for showing how they will look when put on a car.

You should have this booklet. There's a copy waiting for you. Send coupon for it *today*.

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Name .....
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Send me copy of your booklet, "The Care of the Car."

REMY

World's largest Manufacturers of Ignition

THE best authorities agree that your truck investment will not be profitable unless the service is continuous. The one and only way to guarantee continuous service is to guarantee 100% efficient ignition with the famous Remy Magneto.

Remy Electric Company

Anderson, Indiana

Service Stations Throughout the Country

Budd ALL STEEL Bodies

represent the last word in the art of truck body building. They stand for strength, stability, sturdiness and efficiency. Made entirely of steel, they will not rot or crack. They cannot warp or split. They will stand the maximum use or abuse and are practically indestructible. They eliminate fire risk. They are light in weight and easy on tires—pleasing in design and attractive. Summed up in a word, they give the highest degree of Service.

They are made in many styles—of any desired capacity. Estimates promptly furnished. Write us today for full information.

Edward G. Budd Manufacturing Co.

Ontario and I Streets, Philadelphia, Pa.
Detroit Office and Showroom, 796 Woodward Ave.

Adams Trucks
"Deliver the Goods"

FOR SERVICE of the most exacting sort, demanding complete reliability, simplicity of parts and staunchness of construction, Adams Trucks never disappoint their owners.

The summer season calls sharp attention not only to the greater efficiency and economy of motor delivery, but its humane attitude toward horses—those real martyrs of the hot months, as the daily street scenes show.

The change to the better method is easily effected with the Adams, owing to the promptness with which the non-technical man quickly masters it.

Built in 1, 1½ and 2 ton models with special bodies to fit the trades

THE ADAMS BROTHERS COMPANY
438 West Main Cross, Findlay, Ohio

First American Truck Manufacturers to use the French Type Hood (Radiator rear of the motor.)

"Reliable Springs are More important on Commercial Cars than on Pleasure Cars."

THE PERFECTION SPRING CO.
Cleveland - - - - - Ohio

LANGE
TRUCKS
MADE PITTSBURGH A LEVEL CITY

A claim as to the goodness of an article is something every manufacturer makes, whether it be good or bad. The making of a claim and the fulfillment of same are two separate matters. If the article is really good some proofs should be shown to sustain the assertion. In designing the Lange truck, the greatest aim was to produce the ideal, the greatest amount of ton miles for a dollar, not losing sight of the fact that the truck must be dependable. Coupled with this the following facts are inculcated in the Lange truck, which helped to make it the "predominant truck" of Pittsburgh.

First: —Simplicity of design.

Second: —Liberal allowance of cross section, with an even distribution of strength, so as to divide the strains over a large section of area, to avoid crystallization at one point.

Third: —The placing of all parts in the assembly so as to be perfectly accessible and removable without disturbing other parts.

Fourth: —All parts in perfect alignment, yet all points where strain might occur are made universal.

Fifth: —Machine work is all multiple parts and made by fixture and jig processes throughout, and all parts must assemble without any fitting, thus insuring the perfect interchangeability claimed by many, but practiced by few.

Sixth: —The best material for the purpose employed.

Seventh:—Elimination of wearing points, and where they must occur, the providing of easy lubricating facilities, as the less the driver has to do the more liable he is to do it.

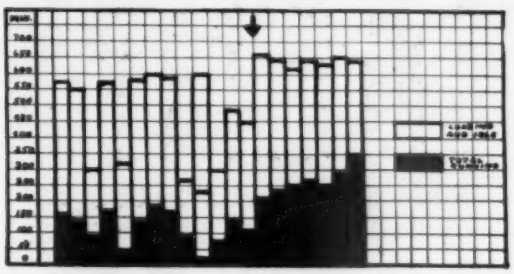
Eighth: —Distinct individuality, the Lange truck being easily discernible alongside any other make.

Ninth: —The recommendation of a large number of users in Pittsburgh, acknowledged to be the "test-ground" of the world.

WRITE FOR CATALOGUE

LANGE MOTOR TRUCK CO.
EAST LIBERTY, PITTSBURGH, PA.

Stopping a Delivery Leak



This Chart Convinced a Firm That Its Delivery Department Could Be Improved

Each of these columns represents the total time in service each day. The first thirteen days show irregular hours of service and a very low percentage of running time.

On the fourteenth day the shipping department was shown how much time was being lost. The improvement speaks for itself. Note the regular time in service and the big increase in tonnage as shown by running time.

When a man finds that his motor delivery is too expensive—"too much trouble,"—one thing is surely the cause; his trucks are wasting time.

The Servis Recorder shows what your trucks are doing every minute of the day. It shows how many trucks you REALLY need to do your work.

Remember this astonishing fact—THE AVERAGE MOTOR TRUCK WORKS LESS THAN ONE-THIRD OF THE TIME—even under the most favorable conditions, carefully supervised by the usual methods of checking.

To the man who is satisfied that his system of handling deliveries is "perfect," **The Servis Recorder** will show, as it has in hundreds of cases, unexpected and costly losses in efficiency.

To the man who knows that there is something wrong with his delivery and cannot put his finger on the leaks, **The Servis Recorder** will give the accurate facts he is seeking.

This is not merely theory. It has been proven in the case of hundreds of concerns, in more than fifty lines of business, in forty-three cities. The actual figures are at the disposal of the man who wishes to make his delivery a source of satisfaction and pride, instead of a vexing problem.

No matter what your delivery conditions are, you should at least investigate what the **Servis Recorder** will do. It will not put you under any obligation. Write today for literature.

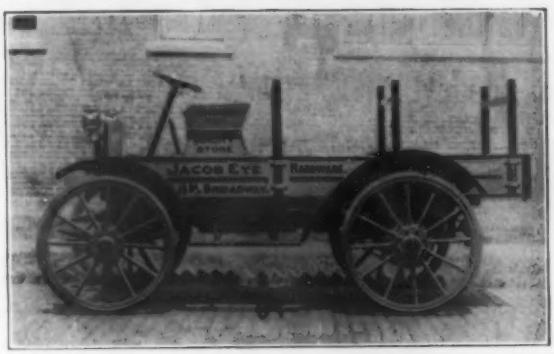
The Service Recorder Co.
2428 E. 105th Street **Cleveland, Ohio**

$800.00 MERCURY TRUCKS $800.00

SPECIAL HARDWARE TRUCK

1000 POUNDS CAPACITY

BUILT SPECIALLY FOR HARDWARE DEALERS



EQUIPPED PER PHOTO: FENDERS, LAMPS, HORN, STAKES, WITH CLEAR 10 FEET INSIDE.

THIS CAR $800.00, OTHER MODELS $750.00 TO $900.00

AGENTS—WE WANT YOU TO GROW UP WITH THE MERCURY

WRITE AND GET OUR PROPOSITION

THE MERCURY MANUFACTURING COMPANY, 4106 S. HALSTED ST., CHICAGO, ILL.

The Only Variable Governor is on the Krebs

"The Car That Thinks"

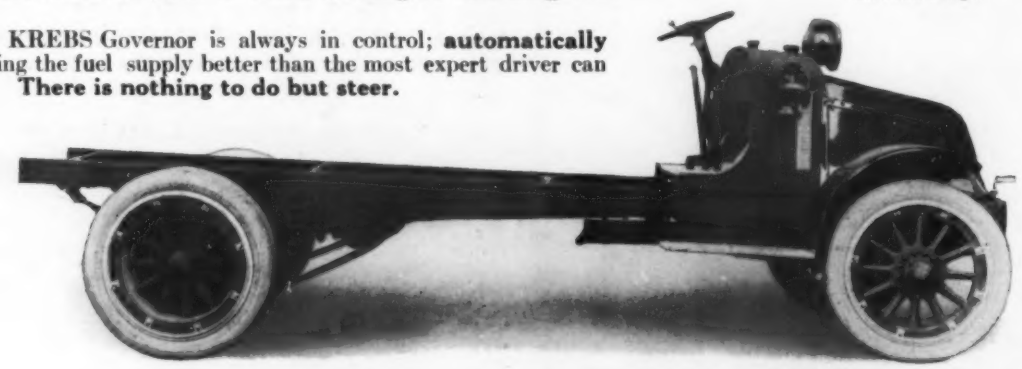
Model DD, 1½-ton Krebs chassis, with 36 x 3½" solid tires in front and 36 x 4" solid tires in rear, $1,775 f. o. b. Clyde, Ohio.

With 36 x 3" dual tires in rear at a nominal extra charge.

Equipped with 36 x 4½" pneumatic tires, singles in front and duals in rear, at a nominal extra charge.

THE KREBS is safeguarded at all times by its variable governor, which maintains any speed within the car's range, **irrespective of road conditions,** without action by the driver. You cannot race the Krebs Motor, either when moving or standing still.

THE KREBS Governor is always in control; **automatically** handling the fuel supply better than the most expert driver can do it. **There is nothing to do but steer.**



Write today for full information about all Krebs Models, and ask concerning open territory

THE KREBS COMMERCIAL CAR COMPANY, Clyde, Ohio

HIGH SPEED
NON-GRAN
BEARING BRONZE

NON-GRAN Bearings In Motor Truck Work

This is Why they stand up and keep the truck on the road:—

With the aid of a microscope, you will see that the polished surface of a bearing, instead of being one solid piece, as it appears to the naked eye, is, in reality, composed of billions of minute particles. Now these particles are constantly being pulled at by the friction of the shaft revolving against them,—just as your hand would be pulled, were you to hold it around a rapidly revolving shaft.

The reason a bearing wears out is because these particles cannot resist this pull and are torn away from the billions of particles immediately back of them. As this tearing away of particles goes on, the inside diameter of the bearing keeps getting larger and larger until it no longer holds the shaft snug.

Whether or not a bearing will show rapid wear, depends upon the **structure** of the bronze and how well the constituent particles can **resist** frictional pull.

The structure of NON-GRAN Bronze is the direct opposite of the granular structure of other bronzes in which the particles have no holding bond between one another.

The structure of NON-GRAN is non-granular, it is fibrous. The particles in its construction are all knit together in a solid mass so that friction on the bearing surface cannot pull the particles from their tightly interlocked positions.

The particles of a NON-GRAN Bearing are thus absolutely secure against all normal frictional pull, and give way **only** to the very occasional abnormal pulls such as would be caused by tremendous continued shaft pressures or the almost complete absence of lubricant.

It is clear, therefore, that the reason NON-GRAN Bearings stand up for from three to five times longer than bearings of any other bronze is because NON-GRAN gives way **only** to **abnormal** friction.

The choice of the world's best car manufacturers should convince you.

SIMPLEX STEWENS DURYEA MARMON GARFORD SAURER MACK

Do you often see cars such as these in the repair shop?

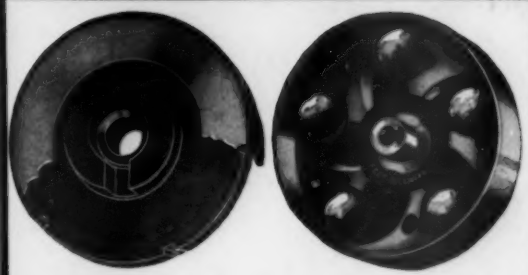
Little wonder that cars of this calibre are so eagerly sought by experienced purchasers

AMERICAN BRONZE COMPANY

Sole manufacturers of NON-GRAN and largest exclusive manufacturers of bearing bronze in the world.

1435-1469 Chester Blvd., Berwyn, Pennsylvania

HIGH SPEED
NON-GRAN
BEARING BRONZE



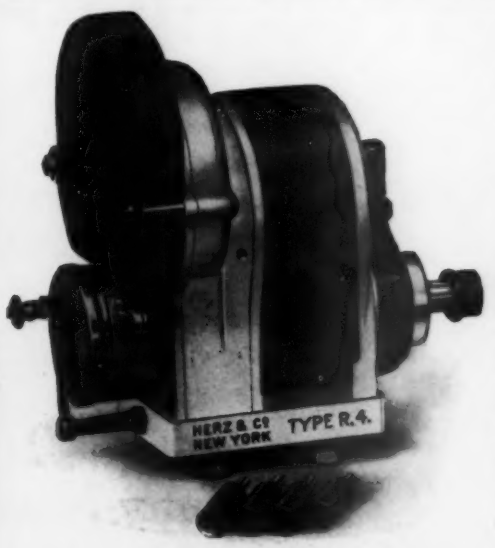
HERZ AUTOMATIC TIME ADJUSTMENT

This simple device marks a tremendous advance in ignition methods from the viewpoint of economy, efficiency and also convenience. In a single step, it has eliminated entirely all pounding and the possibility of back-kicks, reduced gear-changing to the minimum, effected a material saving in gas consumption and insured the maximum efficiency of the motor. It is absolutely noiseless, and *can be attached to any Magneto.*

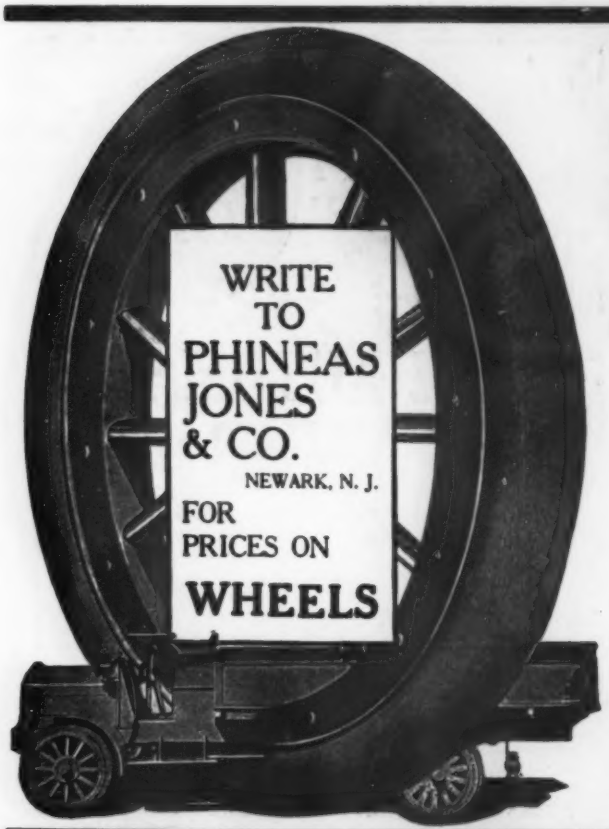
The spark is advanced or retarded automatically in proportion to the speed of the motor. This insures the spark of greatest possible efficiency at all speeds.

That the HERZ MAGNETO is far superior to any other make, for use on Commercial Cars especially, is abundantly proved by recent tests which have established to a certainty the fact that this Magneto is the strongest of its size and weight in the world. In the official English Test against 15 competitors, HERZ MAGNETO gave a hot, efficient spark at 35 R.P.M. as against 45 R. P. M. for its nearest competitor.

Use the **HERZ MAGNETO** with
HERZ AUTOMATIC TIME ADJUSTMENT



HERZ & CO., 295 Lafayette St., NEW YORK
Manufacturers of the HERZ PLUG ("Bougie Mercedes")



AUTOMOBILE WHEELS for PLEASURE CARS and TRUCKS

Repairing and truing old wheels a specialty

Experimental wheels a specialty

We furnish and apply any style demountable or detachable rim or tire

BEST ON EARTH—KANTSAMORE
ESTABLISHED 1855

PHINEAS JONES & COMPANY

305-313 Market Street :: Newark, N. J.
Branch Factory: 12th Avenue and 55th Street, New York City

FULL COMPRESSION LESS CARBONIZATION SAVING IN FUEL COST

ARE NOT THESE THINGS WORTH CONSIDERING ON YOUR COST SHEETS?

These factors are important to you. The more trucks you own, the more important they are. You cannot afford to ignore them if you want your cost sheets to show up right. Get all three by equipping your car with

Leak-Proof Piston Rings

They prevent gas escaping from the combustion chamber—giving full compression; they prevent oil working up—decreasing carbonization; they enable you to get full power from a given quantity of gasoline—thus reducing your fuel cost.

"ASK THE USER" if you want to hear glowing accounts of economy and increased efficiency.

DEALERS—Our sales proposition is profitable and interesting. Write us about it.

McQuay-Norris Mfg. Co., Dept. C

1309 Chestnut St. **St. Louis, Mo.**

BRANCH OFFICES:

NEW YORK, N. Y., Room 83, Lincoln Sq. Court 64th and Broadway
CHICAGO, ILL., Suite 39 Merchants Bldg., 106 N. La Salle St.
PITTSBURGH, PA., 7620 Tioga Street
KANSAS CITY, MO., 1804 Grand Ave.
SAN FRANCISCO, CAL., 164 Hansford Bldg.
LOS ANGELES, CAL., 224 Central Building 6th and Main Sts.
FORT WORTH, TEXAS, 108 Bryan Avenue

When Writing, Please Say—"Saw Your Ad. in the C C J"

An initial investment of $500.00 puts the

Selden Truck

into service—and it will earn the balance of its cost within the year you have to pay for it.

In offering the Selden One-Ton Truck for $2000 on the

Time Payment Plan

we give all users an opportunity to prove the value of this efficient delivery method—To satisfy themselves that the Selden is in a class by itself — A thoroughly reliable truck which will do its work economically, day in and day out.

Our confidence in the Selden Truck could be shown in no better way than by the fact that we are ready to back it with the enormous financial resources which this time payment plan necessitates.

Valuable territory may be open for a reliable agent in your vicinity. It will pay you to write today telling us about your sale and service facilities.

Selden Truck Sales Company

212 East Avenue *Pioneers in Selling Trucks on Time* **Rochester, N. Y.**

S. R. B.
Annular Ball Bearings

Maximum Type

One of the leading automobile manufacturers of this country recently ran a test on Annular Ball Bearings, taking the results of the test of a prominent foreign bearing as indicating 100% efficiency. On subjecting the S. R. B. Annular Ball Bearing to the same test, they found they obtained an efficiency of over 700% as compared to the foreign bearing's 100%.

The maximum number of balls used in S. R. B. Annular Ball Bearings allows them to sustain a maximum end thrust. It also practically doubles the life of the bearing, as compared to a bearing with a smaller number of balls. S. R. B. Annular Ball Bearings have been operated 88,500,000 revolutions at rated loads and without failure. This is equivalent to 150,000 miles with a 36" wheel.

For prices and further data write

STANDARD ROLLER BEARING CO.

PHILADELPHIA, PA.

CULLMAN SPROCKETS and Differentials

in stock and to order.

Send for catalog and let us quote you on your requirements.

CULLMAN WHEEL COMPANY, CHICAGO
1351 GREENWOOD TERRACE

CROCE

1500-POUND DELIVERY WAGON

PRICE, CHASSIS, $1,750 (Closed Body) COMPLETE, $1,850

Croce Delivery Cars are worth looking into whether you are agent or purchaser. Our cars are not built for the man that is looking for cheap material. This car is built to last and is built for the man that knows a good car. THE TIME IS PAST WHEN COMMERCIAL CARS SELL BY THEIR LOOKS.

Remember, Mr. Agent, you cannot build up a business of any standing with a fake-it-up proposition and stand good to build up trade. Get that idea out of your head;—this has been done long on pleasure goods and is done every day.

But commercial cars are different, it must be the best to stand the test and this is none too good. Where are you standing, on cars not making good?

Investigate Croce Trucks. You will thank yourself if you do. This is the time to do it. Send for Catalogue (A) —that will tell you from what the Croce Cars are made.

CROCE AUTOMOBILE COMPANY, Asbury Park, N. J.

GASOLINE TRUCKS GMC GENERAL MOTORS COMPANY ELECTRIC TRUCKS

HARD, practical service in scores of different lines of business — daily work in the Philippines, Winnipeg, Calgary, hilly Kansas City and dozens of other American cities in all parts of the continent have demonstrated, beyond question, the decided advantages of ***GMC*** Electric truck design.

This record of service is the logical result of production methods, which have behind them more **continuous** experience in electric truck design and operation than any other electric commercial vehicle.

If your haulage or delivery is suited to the electric truck, there are many reasons for your careful consideration of ***GMC*** Electrics.

All GMC Trucks are backed by GENERAL MOTORS COMPANY, the largest manufacturers of motor-propelled vehicles in the world

GENERAL MOTORS TRUCK COMPANY
PONTIAC MICHIGAN

Makers of Gasoline and Electric Trucks of all Capacities

BRANCHES:—New York Boston Philadelphia Detroit Chicago Kansas City St. Louis

When Writing, Please Say—"Saw Your Ad. in the C C J"

How Far Will G. V. Electric Trucks Go?

Here is convincing evidence. Read it for yourself:

TELENOX 6600

JACOB RUPPERT
BREWER
3RD AVENUE 90TH TO 92ND STREET

NEW YORK, June 28th, 1913.

General Vehicle Company, Inc.,
42nd Street Building,
New York.

Mr. A. P. Bourquardez,
New York District Manager.

Dear Sir:-

You will probably be interested to know that we are daily sending your five ton electrics to the following places:--

To Hempstead, Long Island, round trip 52 miles.
" Great Neck & Little Neck, " " 60 "
" Sheepshead Bay, Canarsie)" " 50 "
East N.Y. & Cypress Hills)
" Mount Vernon, N. Y. two " " 55 "
" Bayonne & Greenville, N.J." " 50 "
" Yonkers, Hastings and)
Dobbs Ferry, N. Y.) " " 50 "

Very Truly yours,

Jacob Ruppert.
Jacob Ruppert Jr. V. Pres.

This is but one example of the increased efficiency of G. V. Trucks. They are the oldest and yet the newest and the best. Over 3000 in daily use. Write for catalogue No. 84 and other data about long-haul trucking.

General Vehicle Company, Inc.

General Office and Factory: Long Island City, N. Y.

NEW YORK CHICAGO BOSTON PHILADELPHIA

When Writing, Please Say—"Saw your Ad. in the C C J"

For Hauling Big Loads

For cities and suburbs, for economical and reliable service, there is no form of transportation that equals an Electric Truck equipped with one of

A 6 Ton Electric Pole Truck equipped with 42 cells, Type M. V.-21 "Exide" Battery

The 4 "Exide" Batteries

"Exide", "Hycap-Exide", "Thin-Exide", "Ironclad-Exide"

A 5 Ton Ice Truck and Trailer. The Truck is equipped with 44 cells, "Thin-Exide" Battery. This truck hauls from 50 to 60 tons per day over the hills of Cincinnati, Ohio.

The cost of hauling a ton for a mile is, after all, the vital question that interests electric commercial car users. As regards the battery, this cost is arrived at by considering the first cost of a battery, its cost of maintenance, cost for charging and the reliable day-in and day-out service that it can be depended upon to give.

Taking all these points into consideration, the four "Exide" Batteries will give the most economical and reliable service. These four batteries have been designed so as to meet every kind of electric vehicle service.

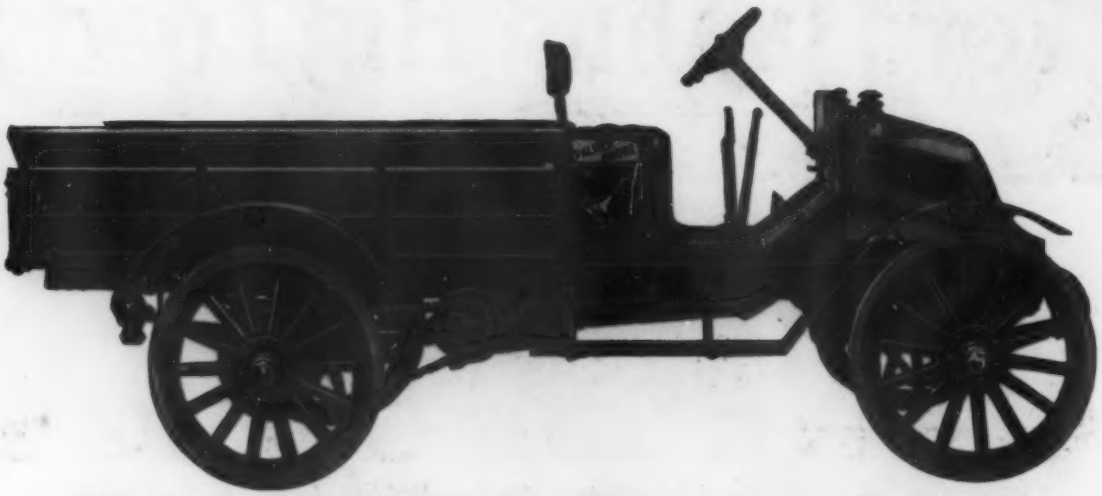
Proof of "Exide" superiority is furnished for the asking—actual facts and figures that demonstrate conclusively that your interests will be best served by using the exact type of "Exide" Battery that is adapted to your service. You should communicate at once with our nearest office.

THE ELECTRIC STORAGE BATTERY CO.

Manufacturer of The "Chloride Accumulator," The "Tudor Accumulator," The "Exide," "Hycap-Exide," "Thin-Exide," and "Ironclad-Exide" Batteries.

New York Boston Chicago **PHILADELPHIA, PA.** Denver San Francisco Seattle
St. Louis Cleveland Atlanta Detroit 1888-1913 Los Angeles Portland, Ore. Toronto

886 "Exide" Distributors 9 "Exide" Depots "Exide" Inspection Corps



Palmer-Moore Trucks Excel For Light Delivery Work

Capacity 1600 pounds
Price as shown, $1425.00

Here are ten good reasons:

1—Simple to drive. Only one lever on the steering wheel to control the engine.

2—Smooth running. The 3-cylinder, 2-cycle engine has the same propulsive effort as a 4-cycle, 6-cylinder.

3—Uninterrupted service. Offers no opportunity for breakdown from tinkering, meddling or careless handling.

4—Low maintenance expense. Can be operated by anybody having ordinary eyes, ears, hands and feet, and is easy as a wagon to keep in order.

5—No tire trouble and least tire expense. The solid tires used are guaranteed for 8,000 miles and save at least 6 cents per mile over pneumatic tires.

6—Simple lubrication. A quart of oil poured into the tank with every five gallons of gasoline is the only engine lubrication required.

7—Air-cooled. No radiator to fill or to leak or freeze.

8—Valveless engine. No jiggers to adjust and no seats to grind.

9—Protected transmission. Gears cannot be stripped by a wrong shaft.

10—No joy riding. Enough speed for all useful purposes but no more.

Every Palmer-Moore Truck is sold with an unqualified guarantee of satisfaction in the service for which the truck is built, and this guarantee is backed by one of the largest plants in the commercial vehicle industry.

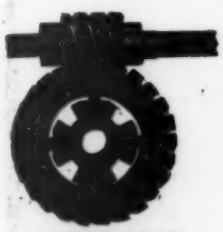
WRITE FOR LITERATURE

PALMER-MOORE COMPANY
SYRACUSE, N. Y.

(7)

CRAMP

Gear Bronzes



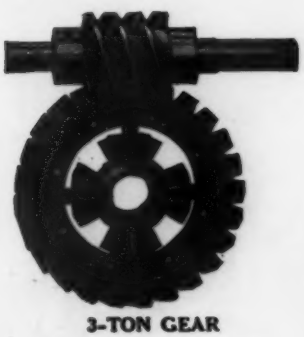
1-TON GEAR

Metals look much alike. Before buying metals it is vitally important to consider the experience and reputation of the manufacturer, to know that the metals you use possess the qualities that will stand up in service and give the maximum of efficiency and wear.

2-TON GEAR

The name CRAMP has for nearly a century set the highest standard in bearing metals. Cramp's metals are the result of almost a hundred years' experience. They have been used during these hundred years for worm drives for every type of machine, from turret turning gear to lifting bridges, elevators, marine railways, etc.

Cramp's metals will give longer life—resist wear and abrasion better—will withstand excessive strain and shock and heavier starting torque than any other gearing metals. Through merit alone, Cramp's metals have achieved dominant place as the world's best metals.



3-TON GEAR

It is no advantage to import metals, we manufacture absolutely the best and save you duty, freight and time.

We furnish the metals and castings for Hindley Spiral Gears.

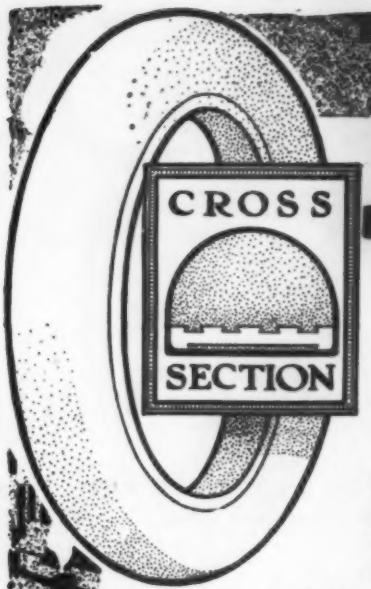
Write us—we can show you how Cramp's metals will better your products.

5-TON GEAR

The William Cramp & Sons Ship & Engine Building Co.
PHILADELPHIA

When Writing, Please Say—"Saw Your Ad. in the C C J"

POLACK TYRES



Do You Figure Cost Per Tyre or Cost Per Mile

SHORT-SIGHTED TRUCK OWNERS and MANUFACTURERS haggle over first cost. *The man who knows* bases his calculations on actual mileage.

That is why LARGE TRUCK OPERATORS use POLACK TYRES. The best Para Rubber in the compound and the 20% excess cushion on the tread combine to insure maximum resilience and wear.

POLACK TYRES always exceed their 10,000 mile guarantee and in many cases cover from 15,000 to 20,000 miles.

POLACK TYRES are 10 years ahead of the field in experience. They can not be equaled for service and prove the axiom that "the best costs less in the end."

"The Standard of Two Continents"

POLACK TYRE & RUBBER CO.

Principal Offices:
246 West 59th St., NEW YORK
Factory: Bridgeport, Conn.
Boston: 146 Summer Street
Philadelphia: 1803 Market Street
Chicago: 1344 Michigan Avenue
Detroit: Goldberg Building
St. Louis: 1013 Locust Street
Pittsburgh: First Ave. and West Street
Washington and Baltimore

INSURE TRUCK SERVICE

Garford TRUCKS

Big business chooses the Garford

Here are a few of the big orders for Garford Trucks placed with our New York distributors during the past six months. In nearly every instance these are "repeat" orders, a majority of the firms having operated from *one* to *sixty* Garfords heretofore.

Interboro Brewing Co., Brooklyn	11 five-ton Garfords
Piel Bros., New York City	6 Garfords, various sizes
Watson Contracting Co., Fordham, N. Y.	10 five-ton Garfords
John Bell Company, New York City	5 six-ton Garfords
Colwell Lead Company, New York City and Brooklyn	6 three-ton Garfords
New York Mail Co., New York City	8 three-ton Garfords
Texas Oil Co., New York City	5 Garford Tank Trucks
New York Police Department,	10 Garford Patrol Wagons
Greenwood Cemetery, Brooklyn	5 Garfords, various sizes
H. C. Bohack Grocery Co., Brooklyn	2 five-ton Garfords
Cranford Company, Brooklyn	7 six-ton Garford Tractors
Dayton Hedges, Contractor, New York City	3 six-ton Garfords
F. L. Cranford, Inc., New York City	2 ten-ton Garford Tractors
Public Service Corp., Newark, N. J.	2 two-ton Garfords
Pittsburgh Contracting Company, New York City	2 six-ton Garfords
Holbrook, Cabot & Rollins Corp., New York City	2 ten-ton Garford Tractors
Farmers Feed Co., New York City	2 ten-ton Garford Tractors
D. W. Kaatze Milk Co., Brooklyn	1 six-ton Garford
Westchester Lighting Co., Mt. Vernon, N. Y.	1 three-ton Garford
Frazer & Burchenal, New York City	2 six-ton Garfords
R. A. Funger Motor Trucking Co., Orange, N. J.	3 six-ton Garfords
L. Wertheim Coal and Coke Co., New York City	1 six-ton Garford
Eastern Asphalt Paving Co., New York City	3 six-ton Garfords
Monarch Auto Trucking Co., Brooklyn	2 six-ton Garfords
N. J. Ice Cream Co., Newark, N. J.	3 three-ton Garfords
Empire State Dairy, Brooklyn	1 ten-ton Garford Tractor
Peter Breidt Brewery, Elizabeth, N. J.	2 five-ton Garfords
Thos. Wood Sons Coal Co., Brooklyn	1 six-ton Garford

The judgment of these big business firms is correct. They chose the Garford because it is the dominant truck in the commercial vehicle field.

There is a Garford that can be used to advantage in *your* business, whether it is large or small. It will pay you to investigate. Catalogue and descriptive literature free on request.

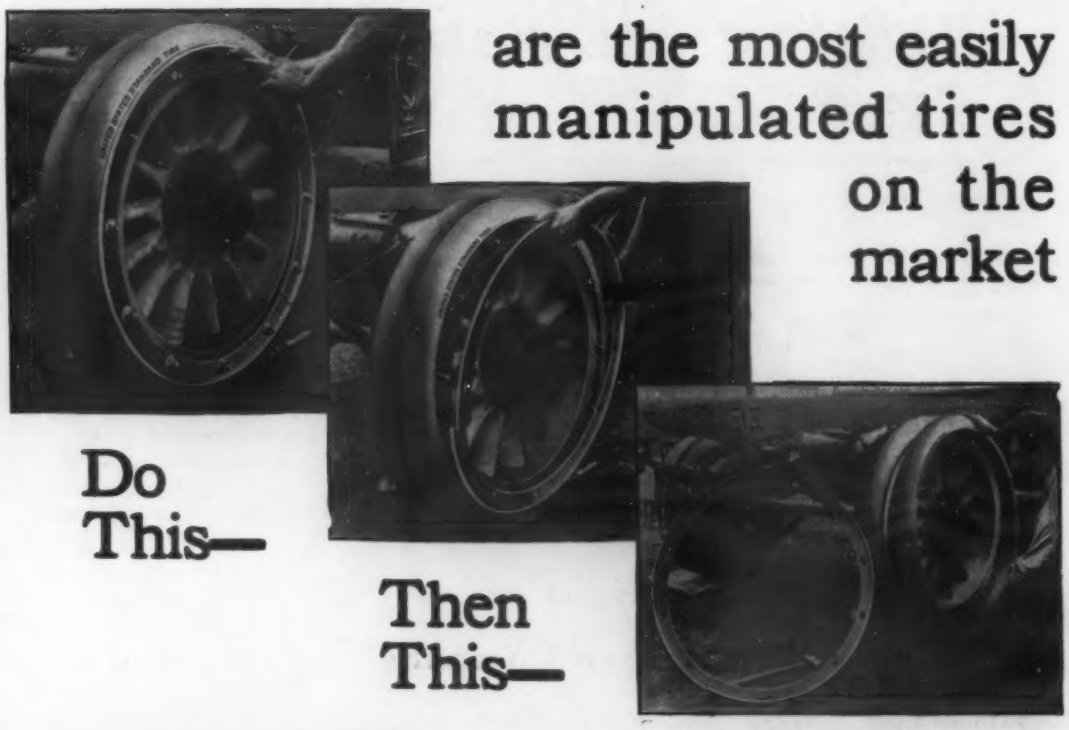
Please address Dept. 11

The Garford Company, Elyria, Ohio

When Writing, Please Say—"Saw Your Ad. in the C C J"

United States Standard Motor Truck Tires

(Demountable)



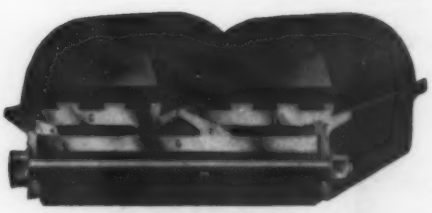
are the most easily manipulated tires on the market

Do This—

Then This—

Then This—

and your Tire is off



Cross Section of the United States Standard Motor Truck Tire

Absolutely Guaranteed for 10,000 Miles

Conditional upon this mileage being used within one year

UNITED STATES TIRE COMPANY, New York

Willys Utility Truck

$1250

(*Chassis Only*)

The first truck of this power and capacity to be sold below $1500

Too much stress has been laid on the efficiency of the truck as an economic factor, and too little or no attention has been paid to the matter of initial costs. You have read a vast amount of comparative economic data in reference to the operation and application of trucks to your business—all of which was very fitting, proper and right. You have heard considerable about *truck costs vs. horse costs.* But so far, the simple subject of *truck costs vs. truck costs* has been ignored.

This is due to various reasons. The most prominent of which is the inability of most manufacturers to produce trucks on a large enough scale to effect any practical reduction in the retail selling price.

But this is exactly what we have done.

The Willys Utility truck is being manufactured in lots of ten thousand and *this is what brings down the price.* This is the largest production of trucks ever attempted.

It is the first really standardized truck the world has ever had.

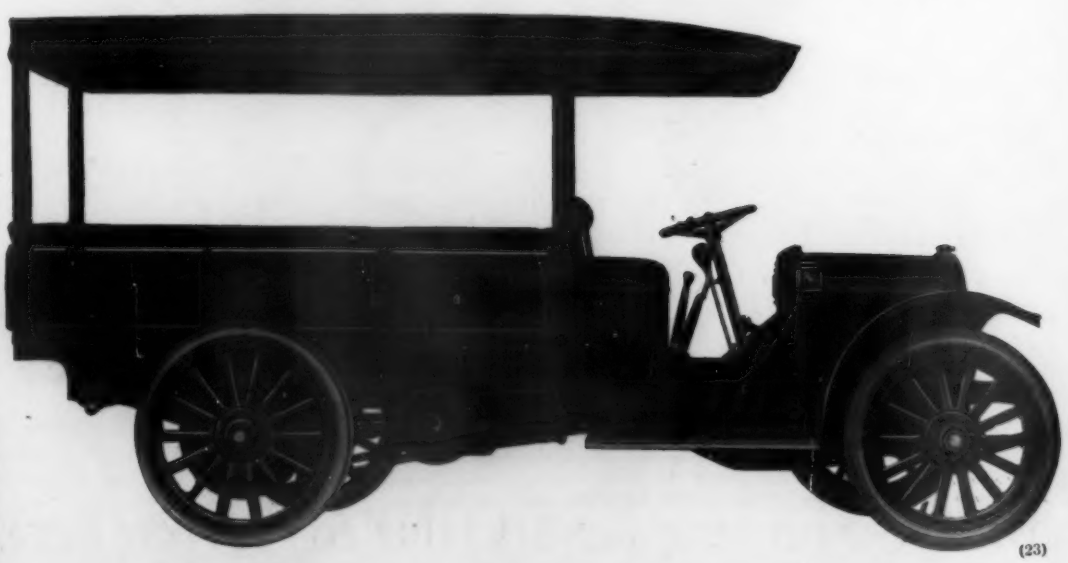
This truck has a powerful thirty-five horsepower motor, which is controlled by our patented governor. It is impossible for the truck to be driven over eighteen miles an hour. It has a heavily reinforced pressed steel frame; both the front and rear axles are unusually rugged; it has a three-speed transmission—three forward and one reverse; it has 34 x 4½ pneumatic tires on the front, and 36 x 3½ solid tires on the rear. The distribution of weight is correctly solved.

We can supply bodies adaptable to any line of business.

Look up our nearest dealer. If there is none near you, write us direct. Specifications, literature and all advice gratis.

Please address Dept. 160

The Willys-Overland Company, Toledo, Ohio



(23)

ENDURANCE IS THE SUPREME TEST

Five times around the earth and still good—two hundred fifty million, five hundred forty thousand revolutions under load do not wear out

NEW DEPARTURE BALL BEARINGS

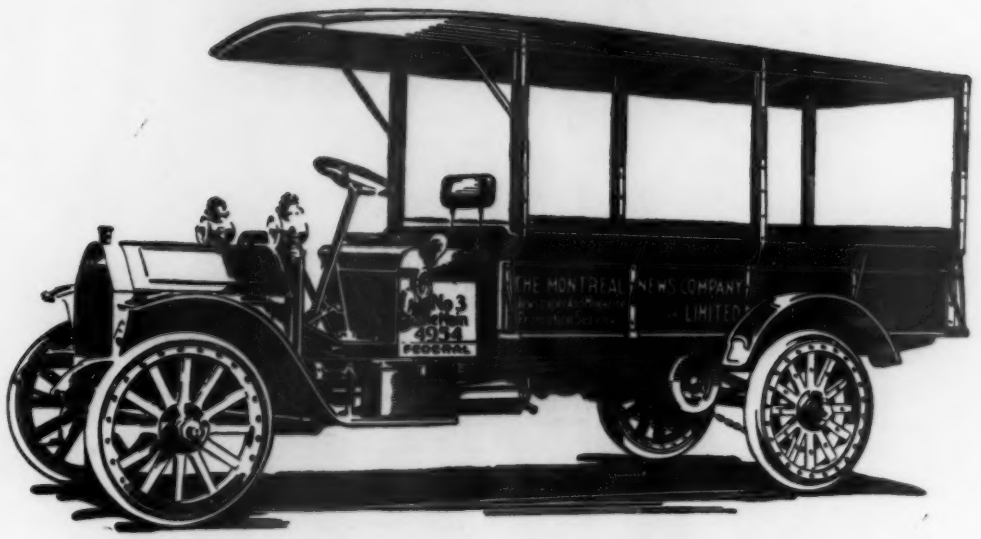
Fulwiler Electric Company
JOBBERS OF HIGH GRADE
ELECTRICAL AND TELEPHONE SUPPLIES
ELECTRICAL MACHINERY
W. J. FULWILER
Abilene Texas.
June 26. 13.
New Departure Mfg. Co.
Bristol. Conn.
Gentlemen:
Am sending you by today's parcel post N. D. Bearings #210 and #307. It might be of interest to you to know the service your New Departure bearings have given. The two bearings are used on the front and rear of the transmission on a Model 16 Buick. 1910. The car has been driven a hundred and twenty-three thousand miles without a minute's trouble with the transmission and as you can see. the bearings are worn but very little. and the bronze bearing that supports the front of the main shaft was entirely gone. and this threw all the strain on the #307 bearing.
I think the N. D. Bearings would run some time yet but as I am overhauling the car. I thought it best to have them reinspected.
Thanking you for your prompt attention. I remain
Yours truly.
J. W. Carter Jr.
Foreman. Fulwiler's Garage.

¶ During the life of these bearings, five sets of bearings of another type were worn out and replaced. New Departure ball bearings work with the least friction and, therefore, give maximum wear and service—American made and guaranteed. Write for interesting literature.

THE NEW DEPARTURE MANUFACTURING CO., BRISTOL, CONN.

Western Branch, 1016-17 Ford Building, Detroit, Mich.

FEDERAL



The Truck Triumphant

You will find the Federal in the employ of America's largest users of motor trucks.

In the employ of America's largest cities—fire departments, police departments, park and boulevard departments.

More than 1000 Federal owners will gladly tell you of Federal Quality, of Federal Character, of Federal Service.

Confirm all the good reports you have heard of the Federal by asking any Federal owner.

A copy of the Blue Book of Traffic will be sent you upon request.

Federal Motor Truck Company

Dept. A DETROIT, MICH.

HYATT QUIET BEARINGS

Line Contact *vs.* Point Contact

THE fundamental advantage of the roller bearing over the ball bearing lies in the fact that it has a line of contact as against the point of contact of the ball bearing.

The great increase of contact thus affected lengthens the life of the bearing by reducing the duty on the operating surfaces.

This basic principle is carried even farther in the Hyatt Roller Bearing by the use of a flexible roller that relieves the shafts and gears of excessive strain.

Vibrations that are ordinarily transmitted by other types of bearings are cushioned and absorbed by the Hyatt. It is this feature of the Flexible Roller that reduces noise.

HYATT ROLLER BEARING CO.
DETROIT. MICHIGAN
Works, Newark, New Jersey

PIONEERS

When others laughed at the thought of wireless tires, we were experimenting. When others began to think seriously of them, we had demonstrated their superiority. When others began to experiment, we had a proven success. We led as pioneers and we still lead by the same comfortable margin.

GIBNEY WIRELESS TIRES

are as far in advance today as they were when they were the only wireless tires in the market. Their superiority is not theoretical, but proven. Their efficiency and economy have been established beyond question. Those who know them by practical usage cheerfully admit they are

3 YEARS AHEAD

There is a splendid selling opportunity for capable agents who want a tire that will overcome opposition. Write us about it.

GIBNEY TIRE & RUBBER COMPANY

FACTORY CONSHOHOCKEN, PA.

PHILADELPHIA
NEW YORK
BOSTON
MINNEAPOLIS

"Better than Seven Dump Wagons"

That was what a man said recently about his

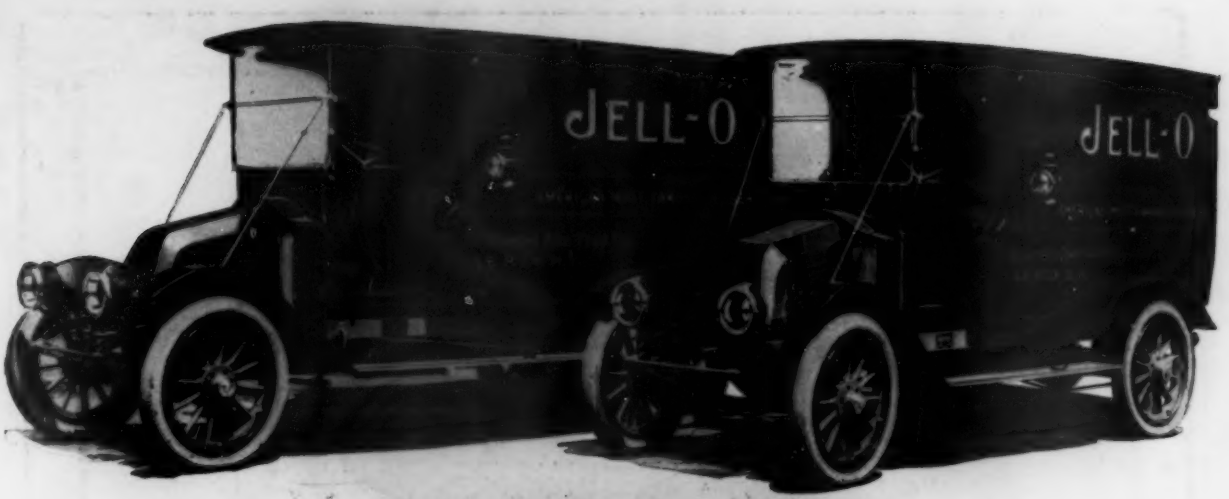
PIERCE-ARROW
5-Ton Motor Truck
Worm Gear Drive

He was superintendent on a job where construction materials were delivered on a short haul—the severest test of truck efficiency. For weeks the truck averaged fifty round trips of 1.3 miles in each ten-hour day. Never less than five tons was handled—frequently more. He estimated conservatively that the truck was making 162.5 ton-miles per day.

Seven dump wagons couldn't have done the work, the superintendent said.

That's just one more proof that in any line of business the Pierce-Arrow, with its power-conserving, economical worm-gear drive, can be depended upon to get the results under any conditions. Its business is to haul its load, and whatever that load happens to be, the results are the same.

The Pierce-Arrow Motor Car Company, Buffalo, New York



$1500 **Stewart** Delivery Trucks **$1500**

NEW PRICES

Effective August 1st, the Chassis Price of Stewart Delivery Trucks is reduced from $1650 to $1500

Increased output and reduction of manufacturing costs make possible this reduction in price of Stewart delivery cars. A year's successful manufacturing has shown us where we could cut down "overhead" and increase our production without added expense. The savings thus made we are passing on to our customers.

The reduced price, however, means no reduction in the quality of the Stewart cars, either in material or workmanship. We will continue the same high-grade construction—as evidenced by our use of such standard parts as these:

Continental Motor, 30 h.p., 3¾" bore x 5½" stroke
Timken Axles, front and rear
Brown and Lipe Selective Transmission
Multiple Disc Clutch
Bosch Magneto
Gemmer Steering Gears

A number of improvements have been added, such as foot accelerator, dash adjustment for the carburetor, and other refinements making for convenience and economy.

Proved by a Year's Use

No radical changes have been made in the Stewart trucks, because a year's hard use in 60 cities in 42 different lines of trade has shown that radical changes are unnecessary. Stewart trucks have proven this. They have made good—both for customers and for dealers.

The Wise Dealer's Foresight is The Poor Dealer's Hindsight

The success of Stewart trucks in the hands of our dealers has already proved the wisdom of those dealers who took on the line at the beginning. Every Stewart sold is a moving salesman, helping to bring in more orders. There is still good territory open, however. There is still opportunity for prudent dealers to take on this profitable line. Selling Stewart cars is an all-the-year-'round business. No seasons; no trading; no heavy expense for entertainment and joy rides—just a plain business proposition to present to sensible business men.

The reduction in price widens the already large market for Stewart trucks. Now is the time to look into this money-making proposition. Write or wire for details.

Stewart Motor Corporation, Buffalo, N. Y.

T. R. Lippard, Pres. & Mgr. *R. G. Stewart, Vice-Pres. & Ch. Eng.*
R. P. Lentz, Sec-Treas.

Separate and distinct from any other truck company using our name or the names of our officers

Stewart Motor Corporation, Buffalo, N. Y.
Please send literature and dealership proposition
Name.....
Street.....
City.....
State.....
CCJ

Baker Electrics

Baker Electric Trucks

Why the Maintenance of Baker Electric Trucks Must Be Low

There are only a few moving parts to the Baker power plant. The wearing parts are inexpensive; the construction is simple; every truck is subjected to rigid tests.

Maintenance cost must be low

The absence of cooling systems, valves, carburetors, ignition system, gears, clutch, etc., etc., must of necessity make the maintenance of a Baker much less than that of any gas truck. Baker trucks are in service 98% of the working time. Can a gas truck make such a showing?

Steady, economical service—absolute dependability—rather than excessive speed is needed most in transportation work. That's why so many Baker trucks are used.

If you are looking for greater savings in your own delivery service

Our Free Book, "Why an Electric Truck?"

will interest you. It shows convincingly why Baker trucks are superior to all other forms of mechanical transportation.

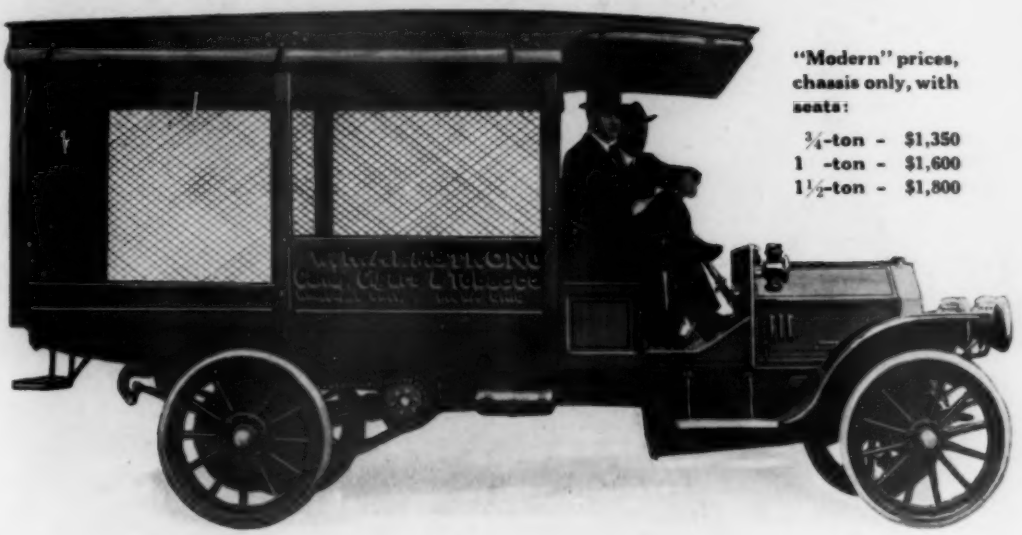
THE BAKER MOTOR VEHICLE CO., Cleveland, O.

Canada: The Baker Motor Vehicle Company of Canada, Ltd., Walkerville, Ont.
Makers of Baker Coupes, Broughams, etc.

Represented in principal cities. Application solicited for representation in open territory.

MODERN

THE BOWLING GREEN MOTOR CAR COMPANY



"Modern" prices, chassis only, with seats:

¾-ton -	$1,350
1 -ton -	$1,600
1½-ton -	$1,800

The Secret of "*Modern*" Service Is to Be Found in "*Modern*" Quality and Methods

Service in a motor truck is what you get for what you pay. It can't be economical unless the quality is dependable and every engineering problem has been solved correctly.

"*Modern*" construction goes to the limit in quality, design and workmanship. Materials and parts are selected and judged by what they will be able to accomplish five—yes, ten—years from today.

We are building "*Modern*" motor trucks with a view to the future. We believe it to be good policy to out-build every other truck sold at anywhere near our prices.

That is why we use Timken Axles and Bearings, Brown-Lipe Transmission and 4⅛ x 5¼ Continental Motor in our 1½-ton "*Modern*." Every other part is in keeping with these high standards.

Extreme strength without awkwardness; extraordinary simplicity of operation and easy mastery of every mechanical part make the "*Modern*" safe in the hands of men who never before drove a truck.

We build bodies for all trades and special uses
Write us today for more complete information

THE BOWLING GREEN MOTOR CAR COMPANY

Department "D" **BOWLING GREEN, OHIO**

Universal Agents are making money out of Universal Trucks—

Why? Because the trucks give good service and we treat the Agents right—

Here's a list of them; Write and see what they have to say about it. Then write us for our sales proposition—

Universal Motor Trucks

List of Universal Dealers

Colonial Motor Car Co.,
Baltimore, Md.
Universal Truck Co. of N. E.,
Boston, Mass.
Foran Furniture Co.,
New London, Conn.
E. A. Eddy Machinery Co.,
Providence, R. I.
A. B. Lewis,
Springfield, Mass.
E. E. Dodge,
Worcester, Mass.
Mason B. Hatch, Inc.,
Buffalo, N. Y.
C. P. Derr,
Chicago, Ill.
Cincinnati Motor Truck Co.,
Cincinnati, Ohio.
Universal Truck Co. of Cleveland,
Cleveland, Ohio.
Arend Motor Trucking Co.,
Akron, Ohio.
Standard Garage Co.,
East Liverpool, Ohio.
R. J. Macklin,
Station A, 807 Woodward
Ave., Detroit, Mich.
M. N. Plumadore,
113 West Wayne St.,
Fort Wayne, Ind.
Eastern Motor Car Co.,
Los Angeles, Cal.
M. E. Grable,
146 West 63rd St.,
New York, N. Y.
James McLay,
New Haven, Conn.
E. A. Perkins Electric Co.
Torrington, Conn.
Riley & Barnes,
Paterson, N. J.
Paxton Motor Car Co.
San Diego, Cal.
Lindsay Motor Car Co.,
St. Louis, Mo.
Star Carriage Co.,
Seattle, Wash.
Mississippi Motor Truck Co.,
Vicksburg, Miss.
U. S. Motor Sales Co.,
Johnstown, Pa.
Hub Machine & Welding Co.,
Philadelphia, Pa.

UNIVERSAL MOTOR TRUCK COMPANY

Detroit FRED K. PARKE, General Manager **Michigan**